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CONDITIONS and site plan of the Competition for Toronto's City Hall are printed. p. 585

THE BANK RATE and its effect on building is discussed by the Minister of Works and others on p. 587

CAPITAL EXPENDITURE on factory building in 1958 is expected by the BoT to be about the same as this year. p. 590

COVENTRY'S housing committee has invited seven firms of builders to compete for multi-storeyed flats on a system designed to cut down time taken in preparation of plans. p. 591

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THE BUILDER

Incorporating ARCHITECTURE & THE BRITISH ARCHITECT

Vol. CXCIII October 4 1957 *No. 5975*

FUEL FOR THE FUTURE

NOT long ago it was announced that flats in Manchester would in future be heated by electricity, and subsequently the London County Council said they would be doing likewise. The immediate attraction is the low cost of installation by comparison with comparable conventional heating, and the general justification of the decision is an assumption that nuclear-powered generating stations will keep electricity costs down, while the costs of other fuels are rising. At the RIBA Conference in Oxford it was evident that a good many architects are thinking this way.

The trend of fuel costs is no doubt true enough, but what architects and their clients have to ask themselves is: 'How long do we have to wait for electricity to become competitive, and what is the situation meanwhile?'

Information is very scanty. Sir Christopher Hinton made some tantalising forecasts of lowering costs of nuclear-generated electricity a few months back, but no one subsequently seems to have tried to establish more exactly what they imply. It was clearly of very great importance to have this done, and in the absence of any investigation by official bodies, *The Builder* has commissioned a study which is published on pages 576-580 of this issue.

This is admittedly a difficult field in which to do accurate forecasting, but the trends seem clear enough and a time-scale has been suggested for them. No single generalisation can sum up the findings beyond, perhaps, saying that with reasonable levels of efficiency other fuels seem to have the advantage for some years to come, and tenants paying relatively high prices for electricity during that time may not be persuaded to silence by the advantage they will eventually gain. This poses a difficult question for architects and their clients. Yet it is too soon to say how much of a difficulty this is likely to be, and what we now require is criticism of the results of this study by any who have data or information which will help to improve its accuracy, and some example-comparisons of conventional and electrical heating systems worked out to show probable capital and running costs. That the trend is right seems not in doubt. But whether the moment has yet come for a general shift of policy on to this basis is a fair question.

Sir John Cockcroft is to speak at the RIBA in December on nuclear energy and its implications for building in the future. It would be a good thing if we could get this matter ventilated among architects before he speaks so that anything he has to say about it can receive an effective discussion.

A PROBLEM OF COMMUNICATION

DIRECTORS of Research under current conditions suffer inevitably from split-mindedness in having simultaneously to conduct fundamental research and an information service. If they expend too much staff effort on information, research suffers; if too much on research, they are accused of dwelling in ivory towers. This perpetual dilemma is apparent in the 1956 report on building research.*

The Building Research Board say they cannot agree that 'any more staff should be diverted to advisory work and the advancement of application,' although the demand is growing, because of the greater importance of the 'long-term and more basic investigations' which produce the results 'from which future applications will flow.' This decision may be right from the point of view of the Building Research Station, but keeping the information service at its present scale must have something of an adverse effect on the building industry. The user of information—architect, surveyor or builder—has his own dilemma in having somehow to keep himself informed about new techniques and materials while doing his day-to-day job. Restricting the BRS information service will be of no help to him.

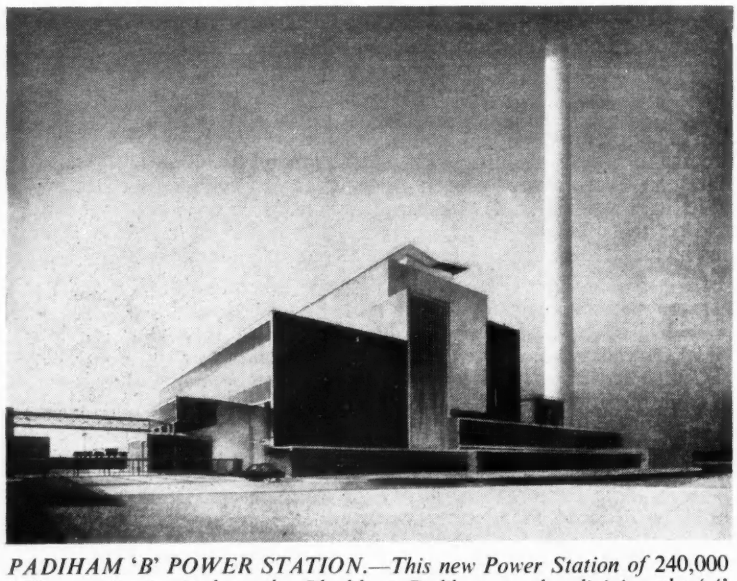
* *Building Research*, 1956. HMSO 5s. 6d.

Is it not time that the building industry did more to inform itself, supplementing individual reading with collective action? Does not such collective action mean the organisation of post-graduate training, which at present is almost non-existent? The information on new techniques is available, but in so amorphous and indigestible a form that it is not being absorbed. In consequence, mistakes tend to be repeated and the industry progresses too slowly. Long ago, the Army discovered refresher courses to be by far the best way of improving techniques. One obtains more real knowledge from a few lectures by experts, with discussions and questions, than from any amount of solo reading. The Army also discovered that students at refresher courses pass on their knowledge in their units so that it spreads through the service.

The building industry could well adopt this method of communication. It has models to follow. There are the short courses of the York Institute of Architectural Study. Last winter the Preston and Blackburn Society of Architects organised a weekend residential symposium at a college of further education and are about to hold another. There are the symposia organised by the RIBA Science Committee. But that is about the sum total of present effort.

If post-graduate and refresher courses are to be organised on the necessary large scale there should be joint consultation between the bodies comprising the industry to study what is needed and to decide what should be done and how. That there would be an abundant response from architects, surveyors and builders is evident from the enthusiastic support forthcoming in the three instances we have mentioned. It seems clear that firms of architects and salaried offices are finding it well worth while to send partners, senior officers or chief assistants to attend advanced courses for as long as several days at a time. These men, being already highly trained, are able to absorb and evaluate the latest advances in techniques and, because they are mostly key men, are in a position to make them effective. But to extend this beneficent influence through the whole industry, proper large-scale organisation and official encouragement are necessary. The unaided efforts of individual bodies, though meritorious, merely touch the fringe of the problem.

No doubt BRS—as well as other bodies which contribute technical information—would be glad to participate in such a service because this would help to simplify their own problems of putting across information. We suggest that an exploratory committee, representative of the RIBA, RICS, NFBTE and BRS—and perhaps other bodies—be set up to examine this problem of making technical advances and research findings effective in present day building throughout the country.



PADIHAM 'B' POWER STATION.—This new Power Station of 240,000 *kW capacity is sited on the Blackburn-Padiham road, adjoining the 'A' station. The responsibility for the scheme is in the hands of the North West Merseyside and N. Wales division of CEA, who have appointed C. S. Allott and Son as consulting civil engineers; the latter have appointed Cruickshank and Seward, FF.RIBA, as their consulting architects to advise in connection with the external design of the buildings. The general design has received the approval both of the RFAC and of the Lancashire Planning Officer. The Divisional Controller of the Electricity Division is A. B. Cooper*

Notes of the Week

SIR ALFRED BOSSOM'S address to the annual conference of the Association of Public Health Inspectors, reported in part in our last issue, contained some stringent criticisms of the British building industry, particularly in regard to their alleged backwardness in mechanisation and to the undue length of time which major buildings take in erection. Sir Alfred has played an important part over the last 30 years since he returned from the United States as a one-man 'ginger group' dedicated to improving the technique of building, and anything he says commands careful attention.

It may be questioned, however, whether Britain's sole architect MP is justified in his comments. In any comparison it is necessary to put like against like, and it is true to say that the best of the builders in Great Britain are fully as up to date and organised as their American counterparts. Where they may be at some disadvantage is in the ready availability of materials, particularly in the supply of steelwork, and in the attitude of clients who too often expect the builder to make good time previously lost by themselves in deciding their needs.

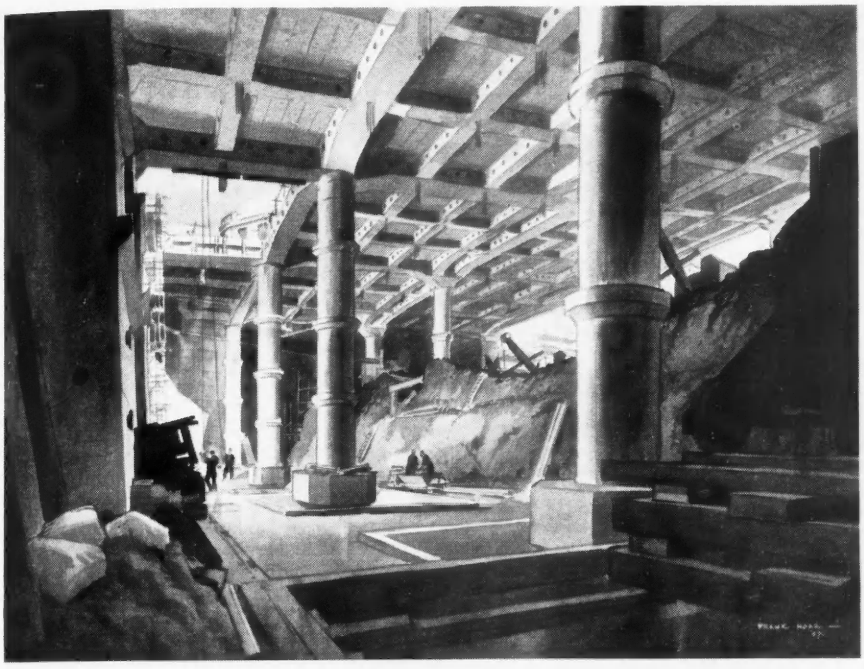
Mr. Peter Trench, managing director of an important London firm, gave a forthright answer to Sir Alfred's comments in a letter to the *Financial Times*, and quoted examples of high-speed building which it would not be difficult to amplify. Mr. Trench expressed the opinion that relatively the British building industry had within the past ten years made more progress than the construction industry in the United States, and certainly this view receives support when the remarkable efforts of British firms operating in a comparable field, Canada, are remembered. Mr. Trench ends his spirited letter by asking Sir Alfred to give particulars of the 'new methods' which he advocated in his speech.

☆ ☆ ☆

NOTHING CAN ENDANGER a great industry like building as complacency, and we should be grateful that there are critics of Sir Alfred Bossom's stature to point to deficiencies. But criticism to be effective needs substance behind it, and it is just this which is absent from Sir Alfred's speech. It is possible to move too fast in adopting the new practices for which Sir Alfred pleads—as the designers of the United Nations building in New York found when they faced the unconsidered problem of what to do with the 50,000 gallons of rainwater per minute which hits the glass-clad façade in time of storm.

A Dickens House to Come Down

FEW WRITERS, probably, had a keener feeling for houses than Charles Dickens, and this is perhaps why his admirers tend to feel so strongly about those in which he lived. His career was marked by removals, and that from 48, Doughty-street to 1, Devonshire-terrace, was probably the most significant, for it was when his success was at last finally assured that he took over the Georgian



BUILDING FOR 'THE DAILY MIRROR,' HOLBORN CIRCUS.— Shown here is a drawing by Frank Hoar of the basement works of this newspaper office for which the main contract (as announced in our last issue) has been placed with W. and C. French, Ltd., of Buckhurst Hill. The joint architects and consulting engineers are Messrs. Anderson, Forster and Wilcox, FF.RIBA, and Sir E. Owen Williams and Partners. The total cost of the scheme is estimated at rather more than £6m.

house opposite the fashionable Regents Park and conveniently near the Royal Academy of Music, where his sister Fanny was a student. There he entertained his wide circle of friends and continued with the raising of his large family until his final removal to Gad's Hill, which he had chosen in boyhood.

Now, in spite of objections from Dickens lovers, his house at Devonshire-terrace is to be pulled down. It is doubtful whether he would have been among the objectors, but the objections were a fitting tribute to his memory. The site, which is intended for redevelopment, also comprises Nos. 2 and 3, Devonshire-terrace, and 15-17, Marylebone-road and on it a block of offices is proposed, partly of six- and partly of seven-storey construction, with 16 new rehearsal studios in a separate wing to replace the Dineley Studios which will be demolished. The architect is Clifford Culpin, FRIBA, of 39, Doughty-street, WC1.

School Decoration

WEST RIDING education committee has issued a pamphlet on school decoration, drawn up by the Chief Education Officer, Mr. A. B. Clegg, and the County Architect, Mr. A. W. Glover, FRIBA. It offers a 33-shade colour chart for head teachers to draw up new schemes for their schools when they require painting. The pamphlet states: 'In new schools lively colour schemes have been used, and in older schools due for redecoration teachers have rightly felt that what was being offered to them was a little dull by comparison.'

The pamphlet makes suggestions for colour schemes to create atmosphere. An assembly hall may be vigorous or dignified, but classrooms for seniors, which are workrooms and where long periods are spent in study, require different treatment, with quiet paints.

Bright, strong colours are needed for corridors and cloakrooms where children spend only short periods, and the head's and staff rooms provide opportunities for a more personal atmosphere. This may give children a standard and setting for home life.

Work done in transforming the Victorian school at Batley, Carlinghow Primary, with small windows and a high roof, is given as an example by Mr. Glover of what can be done with paint and paper. It has already attracted the attention of the Ministry of Education and other education authorities.

Scottish School Kitchens

THIRD in a series of handbooks about school building in Scotland is 'School Kitchens Planning,' published for the Scottish Education Department by the Stationery Office, price 2s. 6d. While much of the data given in its English counterpart (MoE Bulletin No. 11) apply to Scotland also, slight differences of practice in relation to kitchen routine have grown up between the two countries which make the Scottish handbook desirable, not least the fact that the English bulletin deals only with kitchens serving 150 or more meals daily, whereas a distinctive feature of the Scottish educational system is the large number of small schools, often serving remote areas.

Excellently equipped with diagrams and plans of kitchens of varying types and sizes, the handbook suffers somewhat by requiring continual cross-reference to the MoE book; no doubt this has resulted in some saving of letterpress, but it is none the less more than a little tiresome. Between the two publications, however, the architect planning these adjuncts to Scottish schools should find all he needs to know.

'Landscape in Modern Life'

THE FIRST exhibition to be presented in this country by the Civic Trust opened at the Royal Festival Hall on October 2. Entitled 'Landscape in Modern Life,' it was originally prepared by the International Federation of Landscape Architects for their 1956 Congress in Zurich.

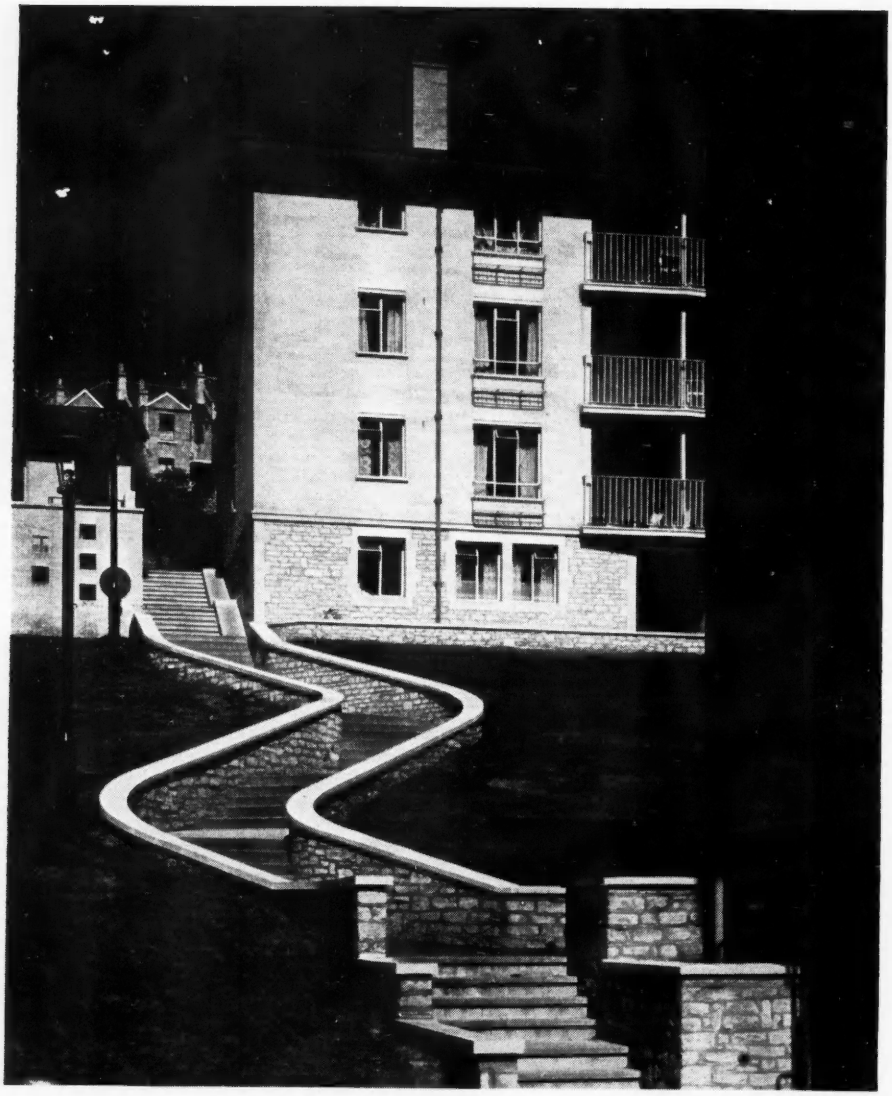
'Landscape in Modern Life' is by far the largest and most comprehensive exhibition of its kind ever assembled. Some 200 panels carry photographs, plans and drawings of the work of 16 member countries of IFLA; contributions have come from three continents and from both sides of the Iron Curtain. The work shown includes complex schemes for green areas in large cities, plans for national parks, the treatment of industrial areas and designs for both municipal and private gardens. It is on view from October 2 to October 16 from 5.30 p.m. to 10 p.m. on weekdays and from 1.30 p.m. to 10 p.m. on Saturdays and Sundays. The exhibition goes to Scotland next month. It will then be shown in the City of Glasgow Museum and Art Gallery from November 2-23.

Consulting Designer Appointed

MR. H. T. CADBURY-BROWN, FRIBA, has been retained as consulting designer by the Turner Asbestos Cement Co., Ltd., (a member of the Turner and Newall organisation) to assist in the future designing of their asbestos cement products. This company was among the pioneers in the development of asbestos cement products in this country, and this new appointment is to meet the continued changes of building trends.

HOUSING at

RIBA Bronze Medal Award, 1957



' Dover House ' block A, and the laundry, from ' Walcot House '

Architect:
TERENCE W. SNAILUM, AADip, FRIBA
(of Snailum, Huggins & Lefevre)

Assistant in charge:
R. G. QUICK, ARIBA

Quantity Surveyors:
W. E. UNDERWOOD & Son

Builders:
J. LONG & Sons (Bath), Ltd.

Structural Consultants:
OSCAR FABER & Partners

Clerk of Works:
A. E. COLEMAN

General Foreman:
A. J. THORNTON

UNTIL clearance, this site of nearly eight acres in area consisted of a maze of small streets and steeply sloping and stepped alleyways, with small industrial-revolution cottage development.

The buiidings concerned are the first in a scheme of slum-clearance redevelopment and the completed scheme will provide for a population of approximately 1,000 persons as against a previous population of about 700.

The site slopes very steeply away from the north side of the main London road and the high costs of roads, services and foundations were one of the main considerations in the problem of replanning. The contours were the governing factor in the layout of the site and in the design of the individual blocks of buildings, and the general approach has been to provide long terrace blocks along the contours in the idiom of Bath, with one block across the contours for contrast and one point block to provide a visual focus for the scheme.

The general slope of the site is approximately 1 in 5, and there are no separate retaining walls in the scheme as the necessary changes of ground level occur at the blocks of buildings which act as retaining walls in

Snow Hill, Bath

SITE PLAN:

A. Dover House

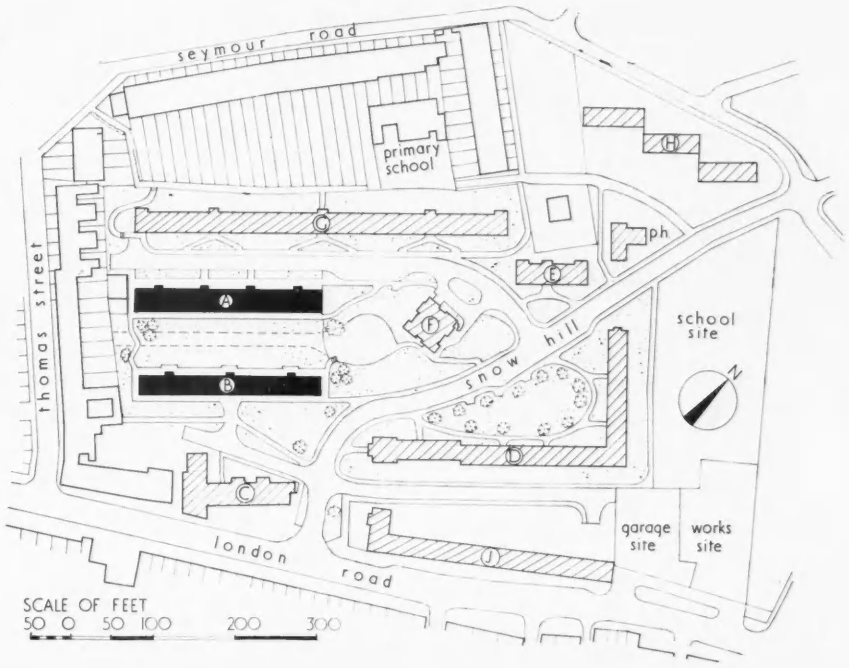
B. Walcot House

C, E & G. Proposed Maisonettes

D & J. Maisonettes and Flats

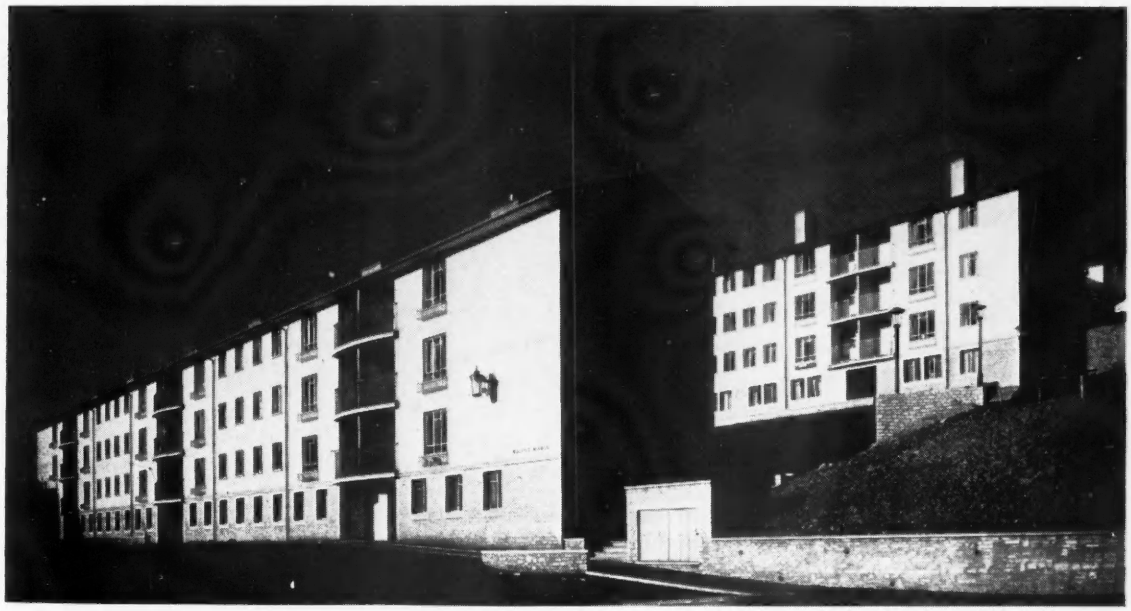
F. Post Office

H. Two-bed Flats



Subcontractors & Suppliers:—

Asphalt and paving, Asphalte Specialists, Ltd.; Bath stone facings, Bath and Portland Stone Firms, Ltd.; copper roof and timber trusses, Broderick Insulated Structures, Ltd.; electrical installation, Canton Electrical Equipment; floor reinforcement, the Trussed Concrete Steel Co., Ltd.; piling, The Pressure Piling Co., Ltd.; wrought iron work, Somerset Smithy.



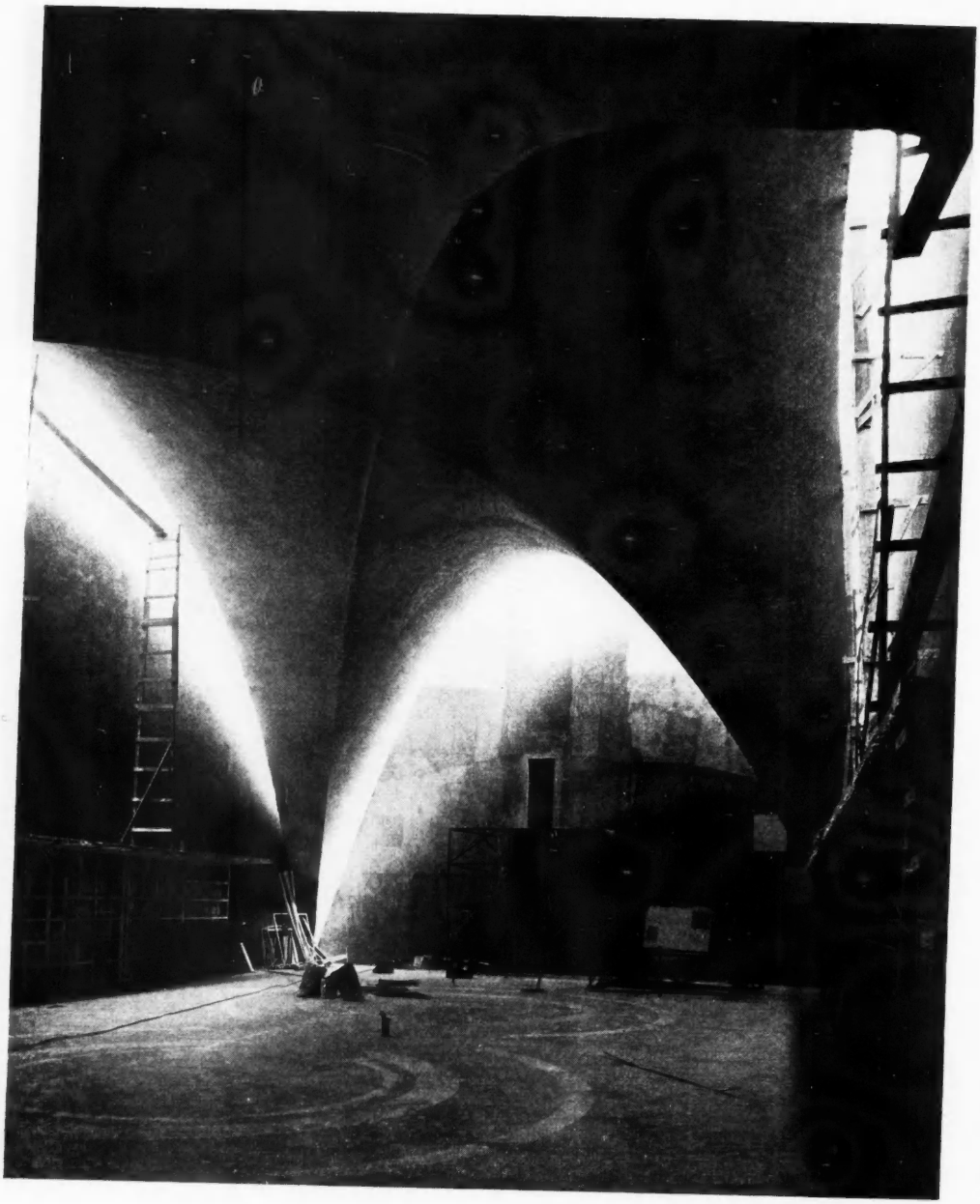
'Walcot House' in the foreground, 'Dover House' to the rear

themselves. This enables the ground around the buildings to be grassed at a slope of approximately 1 in 3½ on which it is possible to use a mower.

Walcot House, the lower of the two blocks concerned, contains 18 two-bedroom flats, and six bed-sitting-room flats; and Dover House contains 24 two-bedroom flats and eight bed-sitting-room flats. The bed-sitting-room flats for old people occupy the front or south portion of the ground floors whilst the back portion of these same floors, partially underground, are used for stores, bins and other ancillaries.

The two blocks are linked by a grassed slope with paths and steps. The laundry block adjoins Dover House, and is equipped to provide washing and drying facilities for the first stage of development. There is also a small open-air drying ground with pierced screen walls.

All foundations were piled owing to the low load-bearing value of the sub-soil, and the general construction is traditional with load-bearing walls. External walls are faced in natural Bath stone rangework. The roofs are surfaced in copper on timber trusses at a pitch of 20 deg.



Interior view showing hyperbolic paraboloid sections

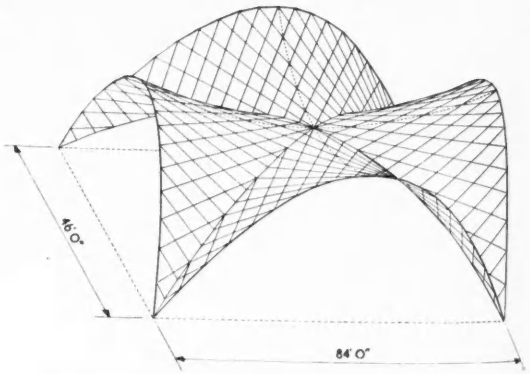
Below: Diagram showing vault construction

STOCK EXCHANGE, MEXICO CITY

FELIX CANDELA, Architect, in association with ENRIQUE de la MORA

THE NEW BUILDING DESIGNED FOR THE STOCK EXCHANGE stands on a very restricted site in a built-up quarter of Mexico City. Built in 1955, its street frontage is eight storeys high, but behind it rises to three storeys only, in order to obtain more light and air by the set-back. It is the hall on the third floor at the rear of the building which is roofed by Candela's remarkable groined vault structure, formed

(*Continued at foot of facing page*)



CORRESPONDENCE

Incentives in the Building Industry

To the Editor of *The Builder*

SIR,—The system whereby an operative could receive suitable incentive for the amount of good work he has done, is akin to the basic principle of all business: viz., the buyer looks for the best, most suitable and cheapest; the seller endeavours to sell (and keep selling) that which gives him the greatest possible gain.

This basic principle is used successfully by the free world and to my mind the operative is in the same position, though not with goods for sale but with his skill and knowledge for sale.

And as this basic principle is not at fault, it must be the method of application which produces the admitted unsatisfactory position today. To tackle the problem we should attempt to cure it, not smother it.

'Bonus'—'piece'—'tape,' etc., work is responsible for greater output (that in itself is an established fact); it is also responsible for a lot of bad work. But let it be recorded that not all the work executed under this system is bad. So there is a basis for a cure.

As always, when one is selling, and the other buying, a large amount of goodwill is required, and where necessary a proper form of contract protecting both parties should be drawn up and adhered to.

If this problem can be solved, may it provide the answer to the higher productivity call?

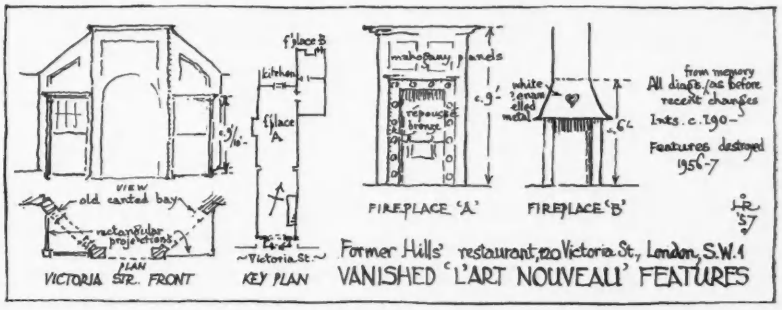
R. T. WHITE (A Site Agent).

69, Wallwood-road, Leytonstone, London, E11.

A Vanished Edwardian Shop

To the Editor of *The Builder*

SIR,—Some of your readers will have known, as a comfortable place of refreshment, W. Hill's restaurant, 120, Victoria-street, Westminster, on the north side near its west end (a few doors from the Victoria Palace). The large canted bay of the mid-nineteenth-century building had been enlivened by charming Edwardian timber-framed projections, making it a shop-window rectangle; inside there were two fireplaces, quite different but each of a simplified 'arts-and-crafts' type, one, in the front shop, having a mahogany chimney-piece enclosing a repoussé copper surround, the other, in a small room behind, an enamelled metal hood (see accompanying sketches). The work bore some resemblance to the old Kardomah café, Cheapside, as it was during the first world war. Information on the designer would be welcomed.



(See letter on 'A Vanished Edwardian Shop')

When it was first mooted that the restaurant was to be closed, the undersigned wrote to the proprietors urging them to ensure the preservation of these features, and they replied, it seemed sympathetically; Dr. Nikolaus Pevsner also wrote in that strain. One now finds both front and interior unrecognisably converted into a clothes shop; the old owners have disclaimed interest and the present proprietor has not so far replied. Dr. Pevsner (he allows me to say) shares my disappointment.

When one considers the amount of other equally important material that must have disappeared—e.g. Buchanan's building, Holborn, with its remarkable turret (see *The Builder*, 26 August, 1955)—one is tempted to wonder how soon it will be before nothing of that period of originality and charm remains.

H. V. MOLESWORTH ROBERTS.

Wallington, Surrey.

Rebuilding Guy's Hospital

Plans for the new surgical block proposed by Guy's Hospital on a site adjoining the present buildings in Bermondsey, have been prepared by Mr. Alexander Gray, FRIBA (of W. H. Watkins, Gray, FF.RIBA, and Partners, 57, Catherine-place, SW1). We regret that Mr. Gray's name was incorrectly given in a previous reference last week. The associate consulting architect is Mr. Paul G. Burt (of Fugard, Burt, Wilkinson and Orth, of Chicago, USA). Other consultants are: consulting engineer for mechanical services, Mr. W. L. Morrison, MICE (Hoare, Lea and Partners); consulting engineer for structure, Mr. L. Scott White, OBE, MICE (R. Travers Morgan and Partners); and quantity surveyor, Mr. Eric G. Lynde, FIAS (Eric G. Lynde and Partners).

Alfred Crampton, FRIBA

A Birkdale, Lancs., architect, Mr. Alfred Crampton, of 35, York-road, died on September 20, aged 74. He was elected FRIBA after completion of studies at Liverpool University and was architect for many Southport buildings including the Synagogue, the Christian Science Church and Broadbents.

External view of parabolic sections

of two intersecting 'saddle' vaults—or four hyperbolic paraboloid sections. The four sections forming the shell are each 46 ft. by 83 ft. 6 in. on plan, and 1½ in. thick. The four perimetral arches incline towards the centre to leave space for glazing between them and the outer wall. The whole interior of the shell has been covered with grey-white acoustic cladding and the walls are coloured terracotta. In this case economy took second place to prestige design, and the shell was conceived solely with the idea of creating a large and interesting coverage for the Stock Exchange hall. Our illustrations are reproduced from 'The Concrete Quarterly,' by kind permission of the Cement and Concrete Association.

Stock Exchange, Mexico City

NUCLEAR ENERGY and the HEATING of BUILDINGS

A Survey and Forecast

By D. DEX HARRISON, FRIBA, AMTPI

Synopsis : This article is an attempt to forecast the relative trend of heating costs up to the end of the century related to the impact of nuclear energy. The three graphs summarise the argument. Graph 1 provides the data for estimating the probable cost of electricity, which is then compared to other fuels in Graph 2. This data is elaborated in Graph 3 to take into account efficiency of utilisation, and from this graph the actual cost of heating by various fuels and types of plant can be compared with each other. A typical comparison is set down in Table 5. The text provides the argument and data from which the graphs are formulated and closes with some remarks on the probable impact of changing relative costs and a speculation on direct heating by nuclear energy.

STATEMENTS in the Press over the past year or so indicating the stupendous scope of the effort being applied in this country to the development of nuclear energy for peaceful uses must have stimulated in many of us speculation as to what effect this might have on the problem of heating buildings. The major effort, at this moment, is going into the development of nuclear power plants for the generation of electricity, but various industrial groups are turning their attention to powering ships with nuclear plant and there already exists a submarine so powered.

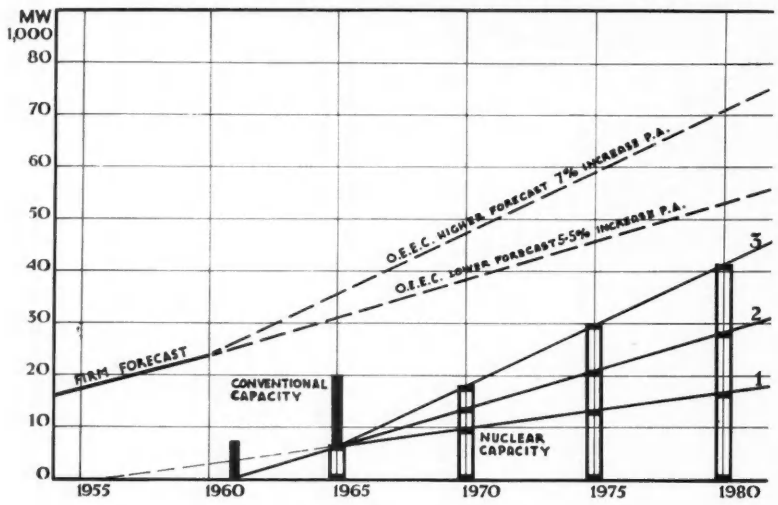
This article was triggered off at the request of the Editor when he read, in a lecture delivered by Sir Christopher Hinton, that electricity produced from nuclear sources might be, by the 1980s, only one-third the cost of conventionally produced electricity. The impact of such a statement certainly needs investigating and I was asked whether I would undertake the task. I did so with marked reluctance, since it became clear, as I read up the subject, that any forecasts which it might be possible to hazard would have to be hedged about with weighty provisos and frequent disclaimers as to accuracy, increasing in measure as one gazed farther and farther into the future.

The accepted method of forecasting the future is to see what has happened in the past and then to project the trend as a more or less straight line graph for as far ahead as one intends to peer. It happens that I am able to fall back on expert sources for a good deal of my initial work of forecasting trends. Graph 1 is a forecast of electrical energy consumption in this country up to 1980 and the relevant data have been culled from two sources. First, the White Paper ' Capital Investment in the Coal, Gas and Electrical Industries,' April, 1957, sets out the predicted maximum demand for electrical energy up to 1960, and this I have shown as a firm forecast on the graph. The continuation of the forecast is taken from a survey of ' Europe's growing needs of Energy, 1955-1975 ' published by the Organisation for European Economic Co-operation (OEEC).

OEEC predict an increasing demand for electrical energy in Europe as a whole at the rate of about 7 per cent per annum as a higher forecast and 5.5 per cent per annum as a lower forecast. The lower of these forecasts continues the rate of expansion of the prediction by the Central Electricity Authority (CEA) up to 1965. The trend of the increase between 5.5 per cent and 7 per cent in electrical energy consumption has persisted for a good many years, and a forecast somewhere between the upper and lower OEEC prediction for Europe as a whole would not appear to be unrealistic applied to this country as well. In the graph I have simplified this increase rate to a straight line.

CEA estimate that, by 1965, they will have to commission a total of 13,500 mW of conventionally fired stations in addition to their nuclear programme of 6,000 mW. This programme is shown in the vertical black columns on the graph at the 5-year interval points. So far we are on assured ground, but from here we enter the realm of conjecture. To give the widest possible validity to the forecast I have put down three possible alternatives and marked them 1, 2 and 3 on Graph 1.

Alternative 1 assumes that the existing programme for installing nuclear capacity up to 1965 will be continued at the same rate up to 1980. This implies installing some 3,500 mW capacity every five years, which appears to be too modest an assumption. Nevertheless, it represented roughly the indicated nuclear programme of CEA until the annual report for 1956 which has just been issued. In this report the Authority say that, by 1975, nuclear capacity is now expected to exceed the 10,000-15,000 installed capacity indicated in the revised programme of the 1955 White Paper. Thus, alternative 1 is already on the way out, and our sights are raised towards alternative 2 with 20 years still to go.



Graph 1.—Forecast of Electrical Energy Consumption in the UK

Alternatives 2 and 3 show what would be required if, after 1965, the whole of the newly commissioned capacity were to be in nuclear plant—alternative 2 based on the lower OEEC forecast and alternative 3 on the higher. Alternative 2 calls for the installation of some 7,500 mW every five years, and alternative 3 some 11,500 mW.

If it is possible to install 20,000 mW in the decade to 1965, even the bigger of these two programmes would

appear to be capable of attainment, and it does not seem unrealistic to suppose that, after 1965, all or most of the new capacity will be obtained from nuclear plant. From Graph 1 we can plot the energy produced from nuclear sources as a percentage of total electrical energy output, thus:

TABLE 1

	1955	1960	1965	1970	1975	1980
Series 1, based on OEEC higher forecast						
Alternative 3	nil	nil	17	38	51	58
" 2	nil	nil	17	28	35.5	39.5
" 1	nil	nil	17	21	23.5	24
Series 2, based on OEEC lower forecast						
Alternative 3	nil	nil	19.5	47	65.5	78
" 2	nil	nil	19.5	35	48.5	53
" 1	nil	nil	19.5	26	30	32

The Minister of Fuel and Power is on record as having said that, by 1965, 25 per cent of the electricity produced in this country will come from nuclear sources, and by the early 1970s, 40 per cent. Whilst the Minister might not support the forecast of rate of increase shown on Graph 1 (which, indeed, might cause anyone to boggle), I take this statement to be some support for the higher of the percentages just given.

The object of Graph 1 is to prepare the ground for making use of Sir Christopher Hinton's forecast of the cost of electrical energy both from nuclear and conventional stations as set out in the Axel Axelson Johnson Lecture, delivered in March this year in Stockholm. These figures were, to say the least of it, remarkable and were as follows:

TABLE 2

Cost of power from conventional stations based on 75 per cent load factor

	1960	1970	1980	1990
Commissioning date				
Cost, penny per unit sent out	0.60	0.67	0.73	0.84
Cost of power from nuclear stations				
Cost, penny per unit sent out	0.66	0.47	0.38	0.32

Sir Christopher Hinton, KBE, FRS, was, at the time he delivered his lecture, managing director, Industrial Group, United Kingdom Atomic Energy Authority, and his forecast, though daring and framed over uncharted ground, must be, I think, accepted as the best prediction we are likely to have for some time to come of the probable cost in the future of producing nuclear energy. It is impossible to summarise in brief space the steps by which this forecast was arrived at, but anyone reading this lecture will realise the weight of the probability in support of the figures put forward. If we accept these figures and equate the costs to the percentage figures given in Table 1 we get the following result:

TABLE 3

Average cost of electricity both from conventional and nuclear stations, in pence per unit sent out

	1960	1965	1970	1975	1980
Series 1, based on OEEC higher forecast					
Alternative 3 ...	0.63	0.645	0.645	0.634	0.60
" 2 ...	0.63	0.645	0.658	0.658	0.65
" 1 ...	0.63	0.645	0.665	0.684	0.68
Series 2, based on OEEC lower forecast					
Alternative 3 ...	0.63	0.638	0.632	0.588	0.54
" 2 ...	0.63	0.638	0.649	0.625	0.62
" 1 ...	0.63	0.638	0.657	0.665	0.68

In arriving at this result, which might appear at first as something of an anticlimax, I have made adjustments for earlier, less efficient nuclear plants pulling down the average in subsequent years and for the continuing existence of older conventional stations having the same effect. For the statistically minded, Table 3 is actually derived from the following more detailed basis:

TABLE 4

	1955	1960	1965	1970	1975	1980
A	Cost of electrical power from older (existing) stations					
	0.60	0.64	0.67	0.71	0.76	0.81
B	Cost of electrical power from new conventional stations					
	—	0.60	0.63	0.67	0.70	0.73
C	Cost of electrical power from nuclear stations					
	—	0.66	0.57	0.47	0.43	0.38

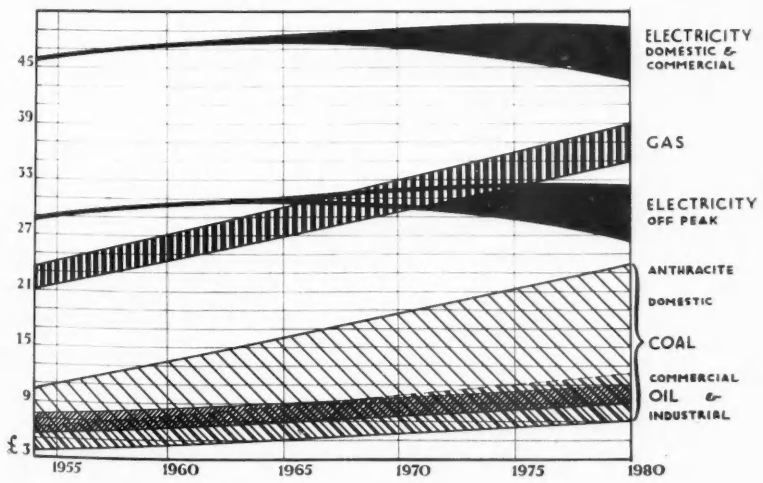
These figures, in turn, have been given various percentage weighting, on a rather complicated formula, so as to take into account the various proportions of the categories of stations A, B and C which could be expected to be still in production in the varying circumstances envisaged in the higher and lower forecasts, coupled to the forecasts 1, 2 and 3 for nuclear power. The resulting figures in Table 3 discount, therefore, to some extent, a too optimistic estimate of cost reduction, if only because a larger proportion of older, less efficient, stations might well be scrapped at an earlier date, more particularly if the higher forecasts of consumption do not materialise.

In Graph 2, we begin to get to the meat of the matter. This graph is an attempt to show the relative cost of heat energy derived from primary and secondary sources, as delivered to the consumer. For this purpose I have taken the following conversion factors:

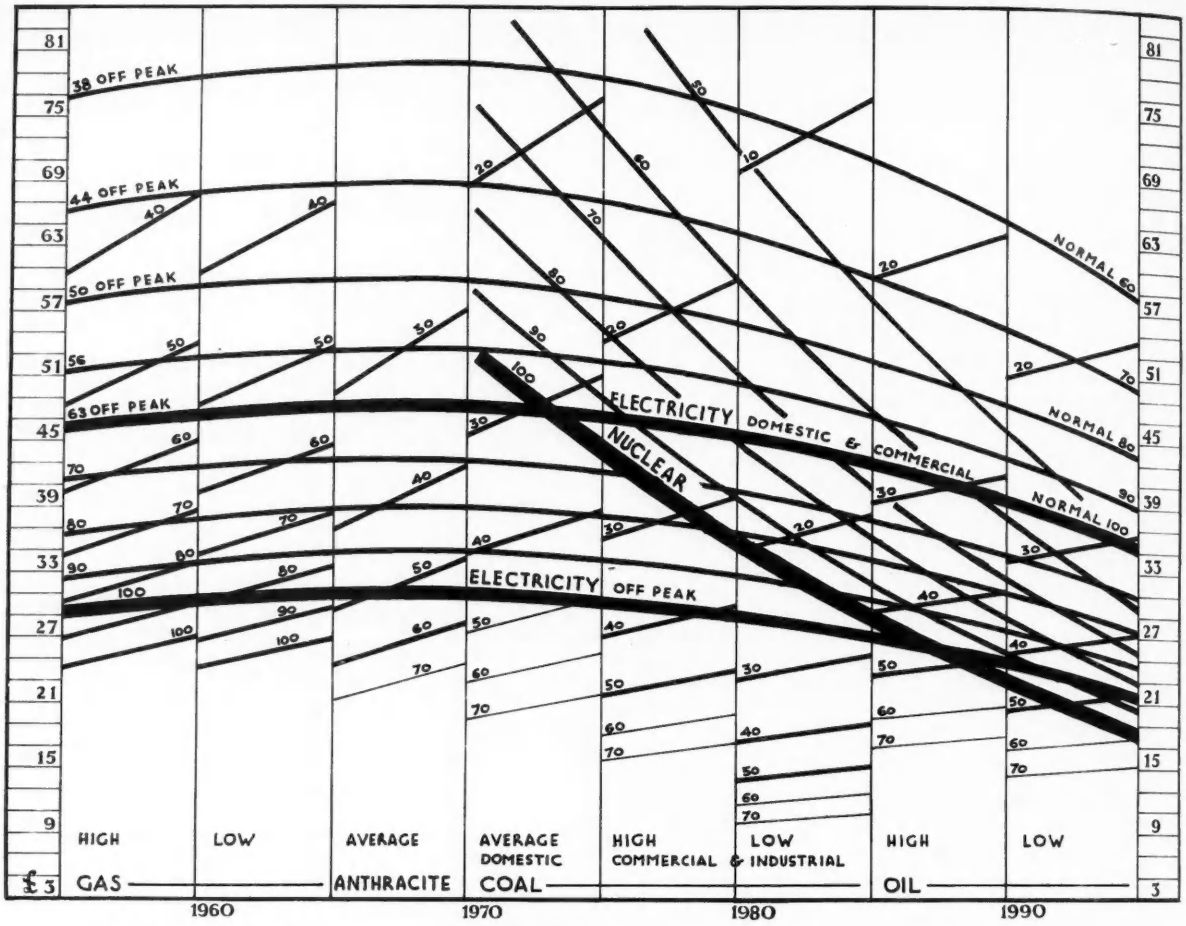
1 ton coal	34,000,000 BThUs
1 ton oil	58,000,000 BThUs
1 therm gas ...	100,000 BThUs
1 unit electricity ...	3,416 BThUs

To these I have applied average low and high costs for the fuel concerned, giving a characteristic band of cost on the graph for each type of fuel. The rate of increase in the cost band for coal I derived from Sir Christopher Hinton. He, in turn, only offers it as a tentative basis, but since he formulates his figures for electrical costs from this data there is, at any rate, some correlation in the graph.

The rate of increase in the cost bands for fuel oil and gas are my own estimates, and I claim no more than this for them. Gas is, of course, tied up pretty closely to coal and in giving it a 75 per cent rise in 25 years as against coal's 100 per cent increase, I do not think I am bearing unreasonably on this fuel.



Graph 2.—Relative Cost of Heat Energy in Tons/Coal Equivalent



Graph 3.—Relative Cost of Heating at various utilisation percentages of available energy (In Tons Coal Equivalent)

Oil seems to me to be quite unpredictable. It should be in plentiful supply, but is dependent upon cost hazards which have little bearing on economic problems. The cost band, showing a 50 per cent relative increase, more or less tallies with the coal band as we reach the 1970s.

Electrical energy costs do not really lend themselves to be treated as a band of cost range. Either you pay a more or less standard tariff of a little over a penny a unit, allowing for the standing charge, or you pay a little more than half this for ' off peak ' loading, when you are getting your fuel at slightly more than the cost per unit sent out from the power station. For this reason I have put down the electrical line twice. It forms a narrow line graph until the variations in cost, beginning in 1970, begin to affect the issue, as taken from Table 3. Thereafter, the triangular form of the graph covers the alternative programmes 1, 2 and 3 earlier considered.

The obviously striking point of this graph is the wide range in cost of fuel to the consumer at the present time in terms of BTh Units supplied; and, on the face of it, the relatively modest decrease in cost of electrical energy, even set against the rising costs of all other fuels, seems of little consequence.

However, one further effort of conversion is required before the true cost of heating from various fuels can be computed, and this is attempted in Graph 3 in which, to the data set down in broad terms in Graph 2, is added a series of conversion factors, in steps of 10 per cent for each type of fuel. In this graph electricity has been taken, for simplicity, at a mean value from 1965 onwards and, consequently, the cost lines represent only an average achievement in the installation of nuclear plant. The cost lines for gas, coal and oil have been divided up into eight vertical columns for clarity but it will be understood that each of the stub diagonals, representing percentage utilisation, are to be projected to the full width of the graph and that, where these projections intersect a percentage utilisation line for electricity, at that point costs of using both fuels balance. For example, if anthracite is utilised at 30 per cent efficiency and electricity at 90 per cent efficiency their cost will balance by 1968 according to this graph, and thereafter anthracite will be the more expensive fuel, in these particular circumstances of utilisation.

This graph also indicates that the higher cost users of domestic coal must already achieve an efficiency of conversion of not less than 20 per cent to compete in economy with electricity at 100 per cent or gas at 50 per cent, represented, for example, by portable electric fires or efficiently flued gas appliances respectively.

Commercial users of low-cost coal, on the other hand, are in a strong position for many years to come since, according to the graph, if they can convert their coal into useful heat at any efficiency greater than 20 per cent, they will be getting their heat more cheaply than by normal tariff electricity until 1987, or for the next 30 years.

The comparisons that could be culled from the graph are, of course, innumerable and beyond the scope of this article. What we are interested in here is the general

observation of the probable downward trend in the cost of electricity relative to all other fuels. This relative trend is already in being, but the effect will increase markedly from 1970 onwards, and one by one, inexorably, the alternative fuels will fall out of the reckoning as the years pass, always assuming that the basic assumptions as set out in Graph 2 are realised.

The following table is an abstract from Graph 3 to illustrate this basic trend over a representative averaged range of fuel and heating systems.

If the diagnosis of the future cost-trends in heating is correct in general terms, the interesting feature would arise, towards the end of the century, that electricity, with the help of nuclear power, would usurp the heating of buildings from most of its rivals and this, in turn, would imply a vast increase in electrical installed capacity, possibly far exceeding even the higher rate of increase that I have indicated in Graph 1.

It has been pointed out to me for example that, if we take 4 BTU/cu. ft. of space warmed, a project such as an Industrial Estate, using off-peak warming, would absorb practically the whole output of an average-sized generating station. A large-scale changeover to electricity as a heating fuel would equally involve very drastic recasting of the supply network, and the difficulties and enormous capital outlay involved in such an operation would in itself be likely to limit the rate of changeover from conventional to electrical heating, particularly in heavily built-up areas, irrespective of the economic merits of the case. However interesting this particular speculation may be to the Electricity Boards, it leads us on here to further speculation, which I have left until the end, as to whether electricity is the only and, indeed, the best means of distributing nuclear power.

NUCLEAR POWER

Is Electricity the Best Means of Distribution?

The sequence of producing electricity from nuclear sources, seems to be this. There is the nuclear generating fuel, which produces heat by controlled fission. The heat is transferred to a carbon or other type of pile, from which it is extracted by a suitable coolant gas or liquid and transferred to a calorifier. In this primary calorifier the

TABLE 5

Period by which various methods of heating will be in cost balance with heating by electricity and nuclear power, taken from Graph 3. (Fuel consumption only, no allowance being made for differential capital costs)

Ref. column in Graph 3	Method of Heating	Efficiency of appliance	Waste heat factor	Nett efficiency	ELECTRICITY Offpeak Utilisation 70	Offpeak factor 50	Normal Tariff Utilisation 90	Normal Tariff factor 80	NUCLEAR Direct U.F. 100	Indirect U.F. 50
		per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.	per cent.
4	Domestic coal :									
	Pre-war type open grates ...	20	50	10	Already u	neconomic				
			30	14	,,	,,				
	Post-war 'efficient' grates ...	30	50	15	,,	,,				
			30	21	1956	1963	1959	1963	1970*	1977
		40	50	20	1956	1963	1959	1963	1970*	1977
	do. with convection ...		30	28	1965	1977	1973	1977	1971	1983
		50	50	25	1961	1973	1969	1973	1970	1982
			30	35	1973	1984	1981	1984	1975	1986
3	Anthracite :									
	Open stoves	45	50	22	1956	1961	1956	1961	1970*	1975
			30	31	1962	1973	1969	1973	1970	1981
	Closed stoves	60	50	30	1962	1973	1969	1973	1970	1981
			30	42	1972	1982	1977	1982	1974	1985
	With exposed flue	70	50	35	1965	1975	1972	1975	1971	1982
			30	49	1977	1986	1983	1986	1972	1987
1 & 2	Gas (average cost) : Flued ...	50	20	40	Already u	neconomic				
			10	45	1956	1963	1956	1963	1970*	1978
		70	20	56	1957	1974	1969	1974	1970	1983
			10	63	1963	1978	1973	1978	1972	1984
	Flueless ...	100	20	80	1975	1987	1984	1987	1976	1988
			10	90	1980	1991	1988	1991	1977	1990
	Central Heating									
5	Coal. High cost users :									
	Small systems and/or inefficient apparatus	30	50	15	1957	1969	1965	1969	1970*	1980
	Efficient apparatus	50	50	25	1975	1985	1983	1985	1976	1987
	Most efficient apparatus ...	80	50	40	1989	2000	1985	2000	1983	1994
6	Low cost users : do. ...	30	50	15	1975	1985	1982	1985	1976	1987
	do. ...	50	50	25	1991	2000	1997	2000	1984	1995
	do. ...	80	50	40	2000*	2000*	2000*	2000	1992	2000*
7	Oil : High cost users	50	50	25	1976	1988	1985	1988	1977	1988
		80	50	40	1993	2000*	2000	2000*	1985	1996
8	Low cost users	50	50	25	1986	1996	1993	1996	1981	1993
		80	50	40	1998	2000*	2000*	2000*	1988	2000*

Notes.—In column 3 very generalised efficiencies for appliances are taken, more for guide purposes than detailed accuracy. It is doubtful whether the best efficiencies shown (such as the 80 per cent. for central heating plant) can be attained in practice, but this is balanced by the wastage factors shown in column 4 which are also very generalised and are intended to take into account inefficient stoking and inflexibility of the apparatus. Thus the wastage factor on gas is very much less than with other fuels. Central heating schemes will vary in wastage factor, the figure of 50 per cent. being a commonly accepted average. The resulting nett efficiency shown in column 5 would all appear to be within the range of normal attainment. The apparent anomaly shown in Table 5, that high cost domestic coal burned in inefficient grates is already uneconomic relative to electricity efficiently used, indicates the limitations of highly condensed information of this sort. The relatively much lower cost of coal gives it much greater cost flexibility in use whereas with electricity wastage there is an altogether disproportionate effect on cost. We are dealing here purely with BThU values usefully provided and have taken no account of comfort conditions or wastages in the spaces to be heated. Such considerations are important, and will inevitably modify the results shown in this Table, but they are too complex to be brought into the scope of this review.

* Indicates that nuclear heating is already cheaper.

coolant transfers its heat to superheat steam and the steam is used to drive the turbines which, in turn, drive generators which produce electricity. The electricity is then transferred over the usual system of distribution so as to arrive at the user's fire in a suitable form to produce heat in the home or the office.

'An Inelegant Procedure'

This is really a most inelegant procedure, and I have taken the liberty in Graph 3 of indicating a graph line to show the possible effect of more direct forms of using nuclear energy. I have started this line at about 1970 on the assumption that, in the next 15 years, our scientists will have overcome the difficulties of supplying direct nuclear heating plant. By analogy from the above, such a plant might comprise the nuclear fuel element, the carbon or similar pile to absorb the heat, the coolant and the calorifier and perhaps a secondary calorifier to convert heat from high pressure steam to hot water.

In formulating the nuclear line on Graph 3, I have assumed that 75 per cent of the cost of a nuclear station lies in the plant up to and including the calorifier and that the smaller plants that we are now considering would be, at first, only 25 per cent as efficient as the large nuclear power plants at that date, 1970. By 1980 I have assumed they would be 33 per cent as efficient and by 1990, 40 per cent. This progressively increasing efficiency with experience being characteristic and, indeed, the basis on which nuclear power generally is expected to become progressively cheaper, I have set down this reasoning to indicate what my guess amounts to for it is, of course, no more than a guess and I simply toss it into the graph for good measure. The arithmetic is as follows:

TABLE 6

Cost of direct nuclear heating
Assumed basis 75 per cent of cost of raising electricity at source

	1970	1980	1990
Cost of power from nuclear stations (in pence per unit)	0.47	0.38	0.32
75 per cent of cost	0.32	0.285	0.24
Relative efficiency factor (per cent)	25	33	40
Cost of heat (in pence per unit of electricity)	1.28	0.85	0.60
Equivalent cost per ton coal ...	1,068s.	710s.	500s.

N.B.—These figures of cost include the capital cost of the heating plant but not distribution plant, mains, etc. As against this the figures to which they are compared in Table 6 are running costs only and do not take into account cost of plant. To this extent the nuclear figures are conservative.

It is assumed that direct nuclear plants will be developed at first as large scale plants for central heating and the difficulty here is that they will be competing on the worst wicket, since it is precisely the large, efficient, low fuel-cost central heating plant that will take the longest time to knock out on cost considerations. A reference to Table 5 shows that this type of plant will still be the cheapest to run until the turn of the century. One disadvantage of nuclear plants will be that they must, presumably, supply heat at a constant rate and therefore be classed as extremely inflexible, involving very large secondary storage apparatus.

Development of 'Packaged Plant'

If, as time proceeds, safe 'packaged plants' can be developed for smaller users, then we can expect a revolution in domestic heating in the 1980s or so, for such plants could be arranged to give something approaching 100 per cent useful heat in the compact volume of the house. The subject is open to wide and stimulating speculation. The time may not yet have arrived to justify taking action on the basis of these large assumptions but it is clear that, whether or not the premises indicated here are wholly valid, a careful and constant watch will have to be kept on nuclear development by those responsible for the building industry.

It would seem also to follow from Sir Christopher Hinton's bold forecast that those responsible for the efficient utilisation of our precious national power resources will have to maintain a constant survey of our natural conversion of power into heat to ensure the least possible wastage, and that this survey must rise above sectional interests, whether in gas, coal, oil or electricity. In setting down these several forecasts I have tried to be unbiased, but I am aware that each and every forecast made is open to attack as being unfair or improbable or inexact. The coal industry might well claim that their costs are not going to rise by the relative degree I have shown and if they can prove this, then the gas industry will march with them. This, however, will be but a putting off of the fateful day, for coal costs are also tied to conventionally-produced electricity and the impact of cheap nuclear power would still produce a relatively downward curve on the electrical graph. Other considerations than cost, of course, have to be taken into account. For reasons of manpower and increasing difficulties in extracting coal, as the best and easiest seams are worked out, it seems improbable that coal production will greatly increase above the figure of 250 million tons per annum, whereas the electricity consumption indicated on Graph 1 would require, on the lowest estimate, some 150 million tons of coal and in the upper estimate some 200 million tons by 1980.

These astronomical figures could not be met, and other sources of producing electricity must, therefore, be found. Oil is the only available alternative other than nuclear power. In this country the decision to go ahead with nuclear power before it has been proved on cost, bold as it was, stemmed from considerations of shortage of primary fuel resources, and these same considerations must be brought to bear on the use of precious fuel in extravagant and wasteful ways of heating buildings.

FUTURE POSSIBILITIES

Need for Extended Study

When I first entered on this study I was not expecting much to come from it, because my mind had been conditioned over the years to accept electricity as an inherently expensive form of heating, but, by the time the pattern of Graph 3 and Table 6 had emerged, I had begun to wonder whether some of my conversion figures were at fault, so striking were the results. In point of fact, the only conversion figures which have so far been criticised are those for coal and oil, which are higher than are generally taken in practice and which, therefore, give an added note of caution to the forecasts. This article is only a personal effort based on all too limited references and information. More extended study by power experts might well cast a different slant on the results shown here and I should like to see such a task undertaken. It could hardly fail to be worthwhile and might lead to a degree of forward planning in the heating field that could take advantage of probable developments, as and when they become economic and thus be an instrument for minimising the time lag inherent in large capital undertakings.

In particular, it would be useful to know 10, 15 or 20 years ahead whether the heating system proposed for a building would, by then, still be economical to run. It would be equally useful for industry to know what sort of plant it should be concentrating on for future production and, conversely, whether there was any extensive future for the type of plant now being made. Such information, if it were available, would enable us to weigh up the relative merits of various schemes with much more authority than can be attempted at present.

South-east elevation

OFFICES on the Great West Road, Brentford, Middlesex, for Gevaert, Ltd.

Architects: DOUGLAS & J. D. WOOD, FF/ARIBA
in association with GEORGES LUST
Architect to the parent company

Consulting Engineer: J. BAK, BSc, AMICE

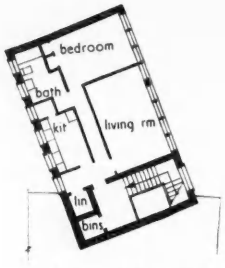
Quantity Surveyors: GARDINER & THEOBALD

Builders: GEE, WALKER & SLATER, Ltd.

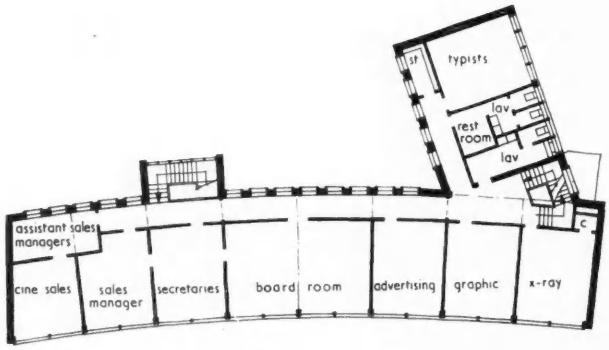
PRECAST exposed-aggregate wall cladding is becoming increasingly popular in Britain; the new building for Gevaert, Ltd., is a typical example of the many finishes which can be obtained by this form of construction. The building is situated at the end of a long straight stretch of the Great West-road and the clients were anxious to utilise the full publicity value of the location.

The building is in two portions: a two-storey block, 140 ft. long, constructed on a concave front of 400 ft. radius to follow the line of the road, and a three-storey block, 65 ft. long, at approximately right angles to it, which faces Lionel-road. The intersection between the two blocks is formed by the secondary entrance and staircase. To provide access to the company's commercial buildings at the rear of the site a 12 ft. wide carriageway is provided through the centre of the main block. The opening extends to first-floor level and the main entrance is on the east side of the carriageway. Both the carriageway and its approach were designed to Ministry of Transport requirements in order to avoid congestion and parking on the main road.

Construction is with *in-situ* reinforced concrete columns and beams with hollow tile floor slabs. Beams

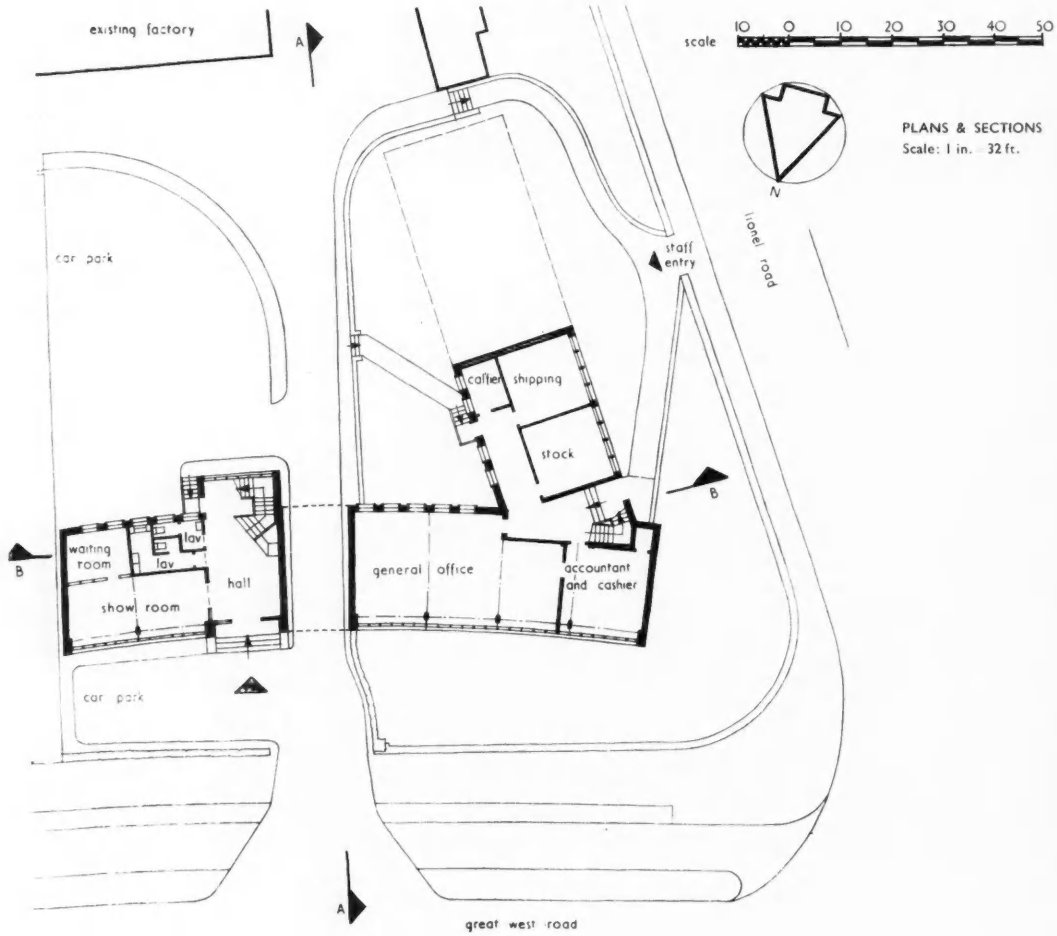


SECOND FLOOR PLAN

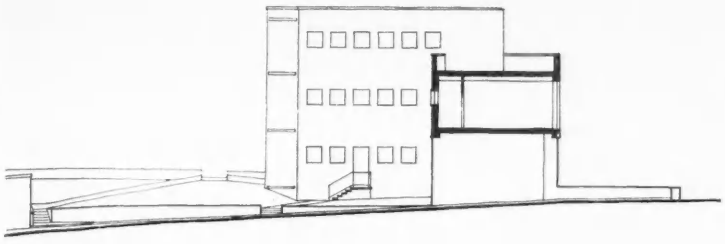


FIRST FLOOR PLAN

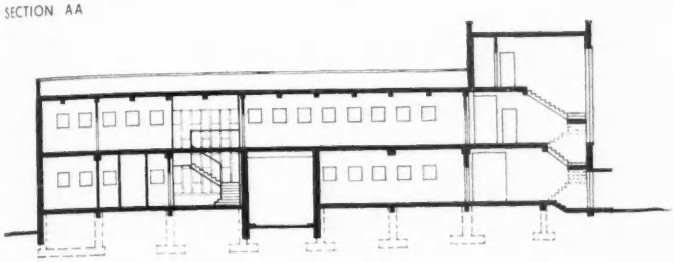
span 22 ft. 6 in. across the building between external columns at 14 ft. 6 in. centres, except on the second floor of the main block, where the façade is set forward 3 ft. and the columns are supported on cantilevered extensions of the beams. All columns are 9 in. wide so that they fall within the thickness of the walls; beams are 9 in. wide and 13 in. deep. Columns were cast on individual foundations which were designed to exert a ground pressure of 3 tons per sq. ft. The 5 in. floor slabs are built up of 3 in. hollow tiles with a 2 in. reinforced concrete topping; $\frac{1}{2}$ in. slip tiles under the floor ribs ensure a flush ceiling soffit. All the staircases in the building are of *in situ* reinforced concrete.



PLANS & SECTIONS
Scale: 1 in. = 32 ft.



SECTION AA

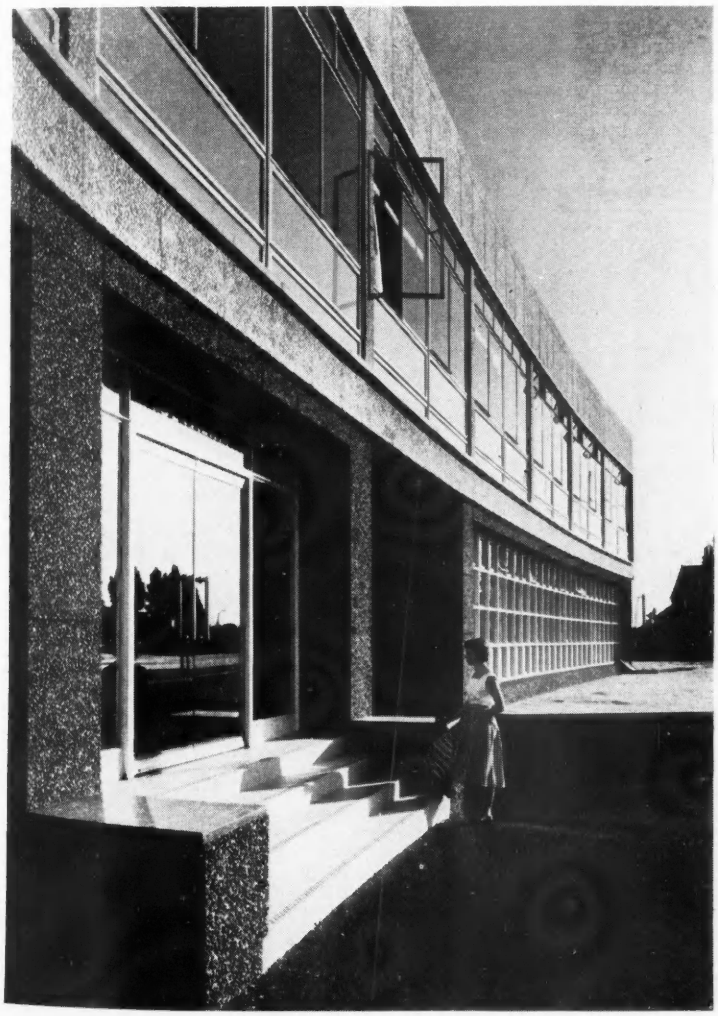


SECTION BB

The façade and end walls of the main block are all clad with 1½ in. thick precast slabs with an exposed aggregate finish. All the slabs were manufactured face upwards to form, in effect, unpolished terrazzo surfaces. Slabs for the bottom storey were cast with green Genoa marble aggregate in black Portland cement; those for the upper storeys are made with white marble in white cement and are lightly polished to produce some degree of reflection from the surface. The slabs were fixed by means of gun-metal clamps and powder-actuated fasteners to either the concrete structure or to 9 in. concrete blocks set in the backing bricks. A 1 in. cavity was formed between the slabs and the infilling of the walls. The rear elevation of the main block, and the elevations of the Lionel-road block are brick faced with window panels of grey rendering.

Subcontractors & Suppliers:—

Steel reinforcement, The Square Grip Reinforcement Co., Ltd.; bricks, W. T. Lamb and Sons, Ltd.; felt roofing, William Briggs and Sons, Ltd.; terrazzo cladding, Malacarp Terrazzo Co., Ltd.; steel windows, W. G. Kaleyards, Ltd.; 'Vitroslab' panels, Plyglass, Ltd.; concrete grid windows and art. stone window surrounds, J. A. King and Co., Ltd.; entrance doors and sidelights, W. G. Kaleyards, Ltd.; heating and hot water installation, Rosser and Russell, Ltd.; electric light installation, Star Electrical Co., Ltd.; plumbing, Gee, Walker and Slater, Ltd.; wood block floors, Hollis Bros., Ltd.; patent flooring, Granwood Flooring Co., Ltd.; terrazzo paving, Malacarp Terrazzo Co., Ltd.; thermoplastic tile flooring, Hollis Bros., Ltd.; sanitary fittings, John Bolding and Sons, Ltd.; flush doors, John Sadd and Sons, Ltd.; ironmongery, Yannedis and Co., Ltd.; balustrades, George Wright (London), Ltd.; 'tyloglaze' dadoes, Quickset Water Sealers, Ltd.; art. stone coping, Enfield Stone Co., Ltd.; waterproofing, Quickset Water Sealers, Ltd.; paint, International Paints, Ltd.



OFFICES, Great West Road, Middlesex

Main entrance

Eggs in the Glue Pot

SOME REMINISCENCES

Mr. W. J. Wills, who for nearly 30 years until his retirement was on the editorial staff of 'The Builder,' of which he was a much-loved and respected figure, has contributed the following reminiscences of his early days in the West Country.

I AM 83, and reading Mr. Kenyon's recent article on 'Dixy Tea' brings back to my memory experiences in a country builder's (a real builder's) yard. Before doing so I must write some form of introduction. My father was an architect and artist. I look at his sketches today, after all these years and much experience in London Art shows, and still think so. He died in 1893 at the age of 43. During his lifetime and the holidays I was taken to his office to keep me, I suppose, out of mischief. I know I used to draw out coloured tile patterns from some catalogues.

I suppose I got from it some early ideas of architecture, for after my father's death a well-known builder, who had carried out work under him, offered me a job at 16s. a week. His yard was about three or four miles away at Clyst St. Mary. I had to be there at six in the morning, which meant leaving Exeter at about 5 a.m. The men, on arrival, used to hang a numbered brass disc on a board hanging outside the office window, and some artful ones would hang up a friend's disc if he were late. One had to watch for this. I used to take my lunch with me, but I became so hungry after the walk that I used to eat it at breakfast time. Sometimes I managed to pick up an egg or two, for the builder ran a farmyard as well and the hens laid anywhere. These I used to boil in the glue pot (not the glue), which was kept in a room known as the drying room, where I, with apprentices, had my snacks. At other times, when hard-driven and very hungry and thirsty, I would go in the 'Half Moon' near by and have a pint of cider and bread and cheese at the cost of 3d. or 4d. I know the bread and cheese was only 2d.

I suppose I was very raw, but the builder had some charming daughters who, on my early arrival, used to bring me in a large cup of coffee topped with a layer of cream. I hope I thanked them adequately; should any be alive today, I do so again. The firm were real builders and sub-contracted nothing except steelwork and heating. There was a joiners' shop, paint shop, plumbers' shop, smith shop and wheelwrights, and they also did a little coffin making. How green I must have been in those, my early days! One day, as I watched the sad job, I noticed the man Charley put a few tin tacks in the bottom of the coffin. I asked greenly what they were for. 'Must make the old chap comfortable,' he said.

How well I remember the wheelwright's shop and on one occasion the making of a milk float. Who today knows what a milk float is? It is a low trap or vehicle which enabled the milkman to hop in and out quickly at the back. What craftsmanship this needed; wheel spokes all shaped by hand and other parts skilfully made and chamfered, the axle turned and pierced for spokes, the wheels shaped and tyred with iron, all done by one man and a boy, and all made from well-seasoned ash.

'The Round Square'

Thinking back, I remember best the long joiner's shop with its many benches, and the jokes on the new apprentices. An innocent boy would be told to ask Bill for the round square. Bill, with an old-fashioned look, would unhang an old w.c. seat with a round hole in it and hand it to him. Another joke was to send the poor boy out for 'twopennyworth of pigeons' milk, and be sure it's fresh.' Readers, if any, do not be shocked, but I once 'designed' a church screen. I was told to go to Pinkhoe Church, near Exeter, and make a drawing of the lovely screen there. I was also sent to Littleham Church, near Exmouth, to sketch another screen. I believe I have the sketches now somewhere. From these sketches I 'designed' a screen which was really made and placed in a near-by church. Connected with the firm was a skilled man who had designed some little flynut or butterfly gadget which was fitted to some bit of machinery and cut out the tracery, leaving it to be finished by hand. The firm were real builders, and built St. David's Church, Exeter, the late W. D. Caroe being the architect, I believe.

I well remember a 'ticking off' I got from an old red-nosed carver recommended by my father. I was watching with great interest how he knocked out the bosses for the oak screen, when the disagreeable old rascal turned to me and said, 'Do they want anybody else at your job?' I went back to the office. Another task I did was to drive a pony (called Dolly) and trap to Exeter and fetch out architects (they all died a natural death) to inspect joinery to see if it was free from knots, sap and wavy edges, etc. The doors were all stacked up and turned back one by one, not too long a look.

On the occasion of a daughter's marriage, the joiner's job was cleared up and the benches clothed and a real Devonshire spread was put down. All the craftsmen (I will not say workers) were invited, and what a family party it was. No managers in charge but the boss. These were the days before motor cars. Being a country builder, the men used to go off to work, walking if not too far, otherwise in carts or dog carts. I can see now the dog cart with several men in it with scaffold planks, ladders and buckets of putty, lime, etc., all loaded up. Wages, I think, were £1 a week all the year round, and they, the men, seemed to make a do of it.

UNUSUAL VILLAGE SIGN.—This village sign at Barrow upon Soar, near Loughborough, to commemorate the coronation of Queen Elizabeth II, has embodied in its design a replica of a fossil of a plesiosaurus found in the Barrow limestone in 1851. The base is of Mountsorrel granite and the panel exposed aggregate concrete; inscribed plaques at the ends are in Swithland slate. The head of the sign, in light teak, is illuminated at night by strip lights. Shields at the top give the names of worthies connected with the village over the centuries. The architect was Mr. F. W. Lax, ARIBA; builders, A. Herbert & Sons; woodwork, Frank Thompson; and concrete panel, John Ellis & Sons, Ltd.

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COMPETITION NEWS

New City Hall and Square, Toronto, Ontario

A NEW City Hall and Square are proposed in the centre of Toronto, Ontario, Canada, and architects of any nationality are invited to submit proposals in open competition. The buildings are to house the City of Toronto and Metropolitan Toronto municipal administrations and various related functions.

The competition will be in two stages, (a) a preliminary open competition and (b) a final limited competition. Professor Eric Arthur, MA, BArch (Liverpool), FRAIC, FRIBA, has been appointed to prepare the programme and conduct the competition. He will act as chairman (non-voting) of the following Jury of Award: Sir Wm. Holford (England), C. E. Pratt (Vancouver), Ernesto Rogers (Italy), Eero Saarinen (USA) and Gordon Stephenson (Toronto). Conditions obtainable on application (with deposit of $5, or equivalent) to Professor Arthur at the City Hall, Toronto, Canada.

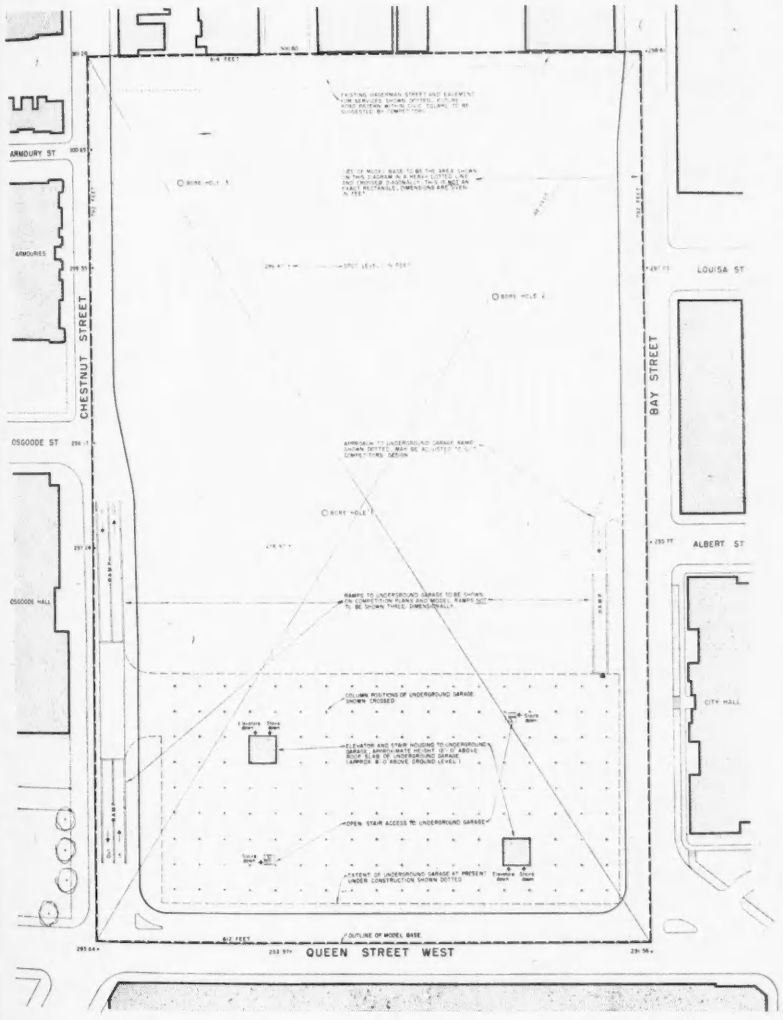
Following the Jury's decision on Stage 1, eight designs will be selected and their authors invited to go forward to the final stage (in which they may submit either a development of their original design, or a design having no relation to the earlier design). Each will receive a prize of $7,500, and the winner in addition to receiving a similar prize will receive advance fees of $25,000 and be appointed architect. If not already a member of the Ontario Association of Architects, he will be required to associate himself with an approved member firm.

Significant Dates

Registration (on a form contained in Conditions) closes on November 22.

Questions (to Professor Arthur) by December 6.

Last date of receipt of preliminary designs, April 18.



SITE FOR PROPOSED CIVIC SQUARE : TORONTO

Competition for City Hall and Square, Toronto: Site plan

Final competition begins (approximately) April 25.

Last date of receipt of final designs, September 19.

The Register of applicants shall remain confidential until the final competition, and the names of those selected for the Final stage will not be released until the winning design is chosen. Registration does not imply an obligation to submit drawings.

Details from Conditions

No limit to cost of the project has been set, but extravagance will not be entertained. As a check, a table of cubic contents is required. Drawings *and* a model are required in both stages. Elaborate drawings (which are to be mainly to 1/32nd scale) are not required but clarity of presentation and a degree of completeness necessary for a proper understanding of the design by the Jury are essential. The accommodation required for departmental space for the next 10 years is given as 251,700 sq. ft. with garage and other space in basement of a further 36,900 sq. ft. Further extension of 25 per cent. is to be indicated but not planned in detail.

The site (shown on accompanying site plan) is bounded by Queen-, Bay-, Chestnut- and Hagerman-streets. The only buildings on the City Square will be the City Hall and elevator penthouse from the parking garage under the Square (where parking on three levels to hold 1,300 cars is proposed).

Note: A copy of conditions may be examined (but not taken away) at the Office of *The Builder*, 4, Catherine-street, WC2.

News of the Week

Thetford Expansion Exhibition

TO MARK advanced preparations for a £3½-million expansion of the former capital of East Anglia, where over 5,000 Londoners are to join the town's 4,650 citizens, an exhibition opened at the Guildhall, Thetford, on October 1.

The exhibition was opened by Sir Humfrey Gale, adviser on town expansion to the Minister of Housing and Local Government. It will show the problems facing London and Thetford and how they can be solved to mutual advantage. Plans and models will illustrate how the town will be developed.

Councillor H. W. Johnson, Mayor of Thetford, presided. Others taking part included Col. Sir Bartle Edwards, chairman of the Norfolk County Council; Mr. R. McKinnon Wood, chairman of the LCC; Mr. W. G. Fiske, chairman of the LCC's Housing Committee; and Councillor G. A. Kybird, Deputy Mayor of Thetford.

The Thetford Borough Council, Norfolk County Council, LCC and Ministry of Housing and Local Government are joining forces in carrying out the scheme. The expansion will provide 1,500 new homes and jobs for families who cannot be rehoused in London. A 40-acre industrial estate is to be developed. There are to be three new schools and additional health, welfare, water, fire, police

and drainage services. The new residential areas will include a few shops, but the present town centre is to develop as the main shopping centre for everyone.

Simplifying Housing Procedure

THE Ministry of Housing and Local Government have revised the procedure for local authorities in submitting proposals for housing tenders, loan sanctions, and so on to the Department (details are given in Circular No. 48/57). A new series of standard forms has been prepared, and it is pointed out that much time will be saved if applications for approval of the project and for loan consent are submitted concurrently.

Local authorities will now be asked to certify that the houses in any tenders which they submit will comply with the building by-laws in force in their district, will include plumbing systems which will ensure a reasonable protection against frost, and that recommended solid fuel appliances will be installed in accordance with the BS code of practice.

Now that local authorities are building high blocks of flats and maisonettes, greater emphasis is put on the desirability of early consultation with the Ministry with the object of reaching agreement in principle on such projects at the sketch plan stage. This will avoid delay and wastage of time on schemes which the Ministry 'may not otherwise be able to approve.'

London's Route 11

WORK has started on the construction of a new road between Aldersgate-street and Moorgate, forming the first section of the projected Route 11 in the City of London. It will take about two years to complete.

This section is part of a long-term plan to relieve the more congested areas of the City by providing a new west/east route from an enlarged Ludgate Circus to Aldgate. It is, however, complete in itself in that it will form a by-pass to the Bank intersection for traffic between Newgate-street and Moorgate. The new road will be 600 yards long and have two three-lane carriageways and two 12-ft. footways.

The City Corporation is building beneath the road an underground car park extending over the whole width of the carriageways for a length of about 400 yards. This imaginative scheme takes advantage of the existing levels and will provide parking space for 250 cars, over which the road will run in the form of a continuous viaduct of reinforced concrete. There will be five vehicle entrances or exits to the car park and a subway on the south side for statutory undertakers' mains. The cost of the whole scheme amounts to £1,320,000. The work will be carried out by contract under the direction of the City Engineer, Mr. F. J. Forty, OBE, MICE.

COMING EVENTS

FRIDAY, OCTOBER 4.

BUILDING CENTRE.—Exhibition 'The Career of Landscape Architecture.' 26, Store-st., WC1. Daily 9.30 a.m.-5 p.m. Sats. 1 p.m. (Continues until October 17.)

MONDAY, OCTOBER 7.

SOCIETY OF ENGINEERS.—'War Damage Reconstruction Work on Premises of Messrs. Peter Robinson, Ltd.' By I. C. Cocking. Geological Society, Burlington-hse., W. 5.30 p.m.

LONDON MASTER BUILDERS' ASSOCIATION (NE Area).—Ladies' Festival, Dorchester Hotel, W1. 6.30 p.m.

TUESDAY, OCTOBER 8.

HOUSING CENTRE TRUST.—Report on the Housing Centre tour to Holland. 13 Suffolk-st., SW1. 6 p.m.

ILLUMINATING ENGINEERING SOCIETY.—'Designing for Harmony.' By E. B. Sawyer. Royal Institution, Albemarle-st., W1. 6 p.m.

LONDON REGIONAL JOINT APPRENTICESHIP COMMITTEE.—Visit to Guildhall Extension Site, junction of Church Alley and Basinghall-st., EC2. 2 p.m. Further visit on October 9 at 2 p.m.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.—Annual dinner. Café Royal, Regent-st., W1. 6.30 p.m.

WEDNESDAY, OCTOBER 9.

INSTITUTE OF FUEL.—One-day symposium 'Flames and Industry.' Institution of Civil Engineers, Great George-st., SW1. 10 a.m.

LONDON BUILDERS' FOREMEN'S ASSOCIATION.—Education lecture. Memorial Hall, Farringdon-st., EC1. 6.15 p.m.

INSTITUTE OF BUILDING ESTIMATORS (London and Home Counties Region).—'Why Price It?' By A. T. Brett-Jones, FRICS. Bedford Corner Hotel, Bayley-st., WC1. 7.30 p.m.

INSTITUTE OF BUILDERS (Newcastle and District Centre), Licentiate Discussion Club.—'The Building Industry, Its Place in the National Economy and Its Collective Responsibility for Increased Productivity.' By D. E. Woodbine Parish, FIOB. Royal Station Hotel, Neville-st., Newcastle-on-Tyne. 7.15 p.m.

THURSDAY, OCTOBER 10.

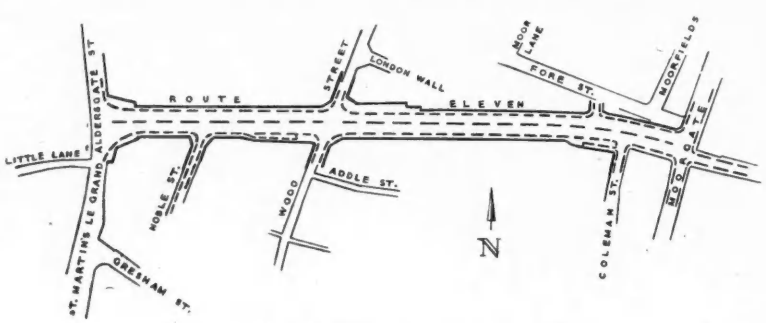
RICS.—Land Surveyors' General Meeting 'The Work of the Nautical Almanac Office.' By Mr. D. H. Sadler, M.A., 12, Great George-st., SW1. 5.45 p.m.

INSTITUTE OF BUILDERS (Licentiate Discussion Club).—'Prestressed Concrete Construction in Moscow.' By Colin Penn, FRIBA. Film and lecture. 48, Bedford-sq., WC1. 6.30 p.m.

SATURDAY, OCTOBER 12.

ROYAL ACADEMY OF ARTS.—Exhibition of works by Sir Gerald Kelly, KCVO, PPRA. Royal Academy Diploma Gallery, Burlington House, Piccadilly, W1.

ECCLESIOLOGICAL SOCIETY.—Visit to St. Mary's Church, Islington and Holy Trinity Church, Cloudesley-sq., Islington. 3.45 p.m.



Route 11, *Aldersgate-street to Moorgate*

Hinkley Point Power Station

TAYLOR WOODROW CONSTRUCTION, LTD., who are associated with the English Electric Company, Ltd., and Babcock and Wilcox, Ltd., on atomic power station work, have been concerned with the following consultants on the design of the civil and building works for the atomic power station at Hinkley Point: Frederick Gibberd, CBE, FRIBA, architect, 8, Percy-street, W1; C. S. Allott and Son, consulting engineers, 20-22, Bedford-row, WC1; United Steel Structural Co., Ltd., structural steel engineers, 40, Grosvenor-gardens, SW1; and G. N. Haden and Sons, Ltd., heating and ventilating engineers, 7-12, Tavistock-square, WC1.

Mr. Frederick Gibberd has also been appointed by the CEA as landscape architect for the station.

Landscape Architecture

AN EXHIBITION entitled 'The Career of Landscape Architecture' is being held at the Building Centre, 26, Store-street, WC1. Sir William Holford, MA, FRIBA, performed the opening ceremony on October 3.

The exhibition is divided into two main sections—the first is an introductory one illustrating the scope of the profession; the second shows the work undertaken at the four universities and colleges which have established courses. It continues until October 17.

Professional Announcements

MR. G. AGAR, PFAS, FFS, building and quantity surveyor, has recently moved his offices to 37, Bedford-square, WC1 (tel.: Museum 6595), at which address he will be pleased to receive trade catalogues.

MR. H. BRYAN TWEED, ARICS, chartered quantity surveyor, of 20, Tithebarn-street, Liverpool 2, has opened a branch office in Manchester at F7, Victoria-buildings, 32, Deansgate, Manchester, 3 (tel.: Blackfriars 3851), and would be glad to receive trade catalogues, etc., at this address.

The new office address of MR. ROWLAND H. WILLIS, FRICS, is Bank Chambers, 4, Market-place, Kingston-on-Thames, Surrey. (tel.: Kingston 6378.)

FROM 'THE BUILDER' OF 1857

Saturday, October 3, 1857.

A NEW VIEW OF THE SEWAGE AND THAMES PROBLEMS.—The authors had made 25 weekly examinations of the Thames, microscopical and chemical, of the water at high and low tide. From their experiments it appeared that the sewage poured into the river was, for the most part, destroyed by the innoxious processes of oxidation and vital developments, and that a very minute proportion only underwent the putrefaction, properly so called. The amount of organic matter existing in the water did not appear to be any criterion of the offensiveness of the water, inasmuch as the greater proportion of the organic matter was in the state of living beings.—*From an Article.*

***The numerous references to sewage disposal in *The Builder* of 1857 show that this was a burning problem a hundred years ago.—ED.

Building and the Bank Rate

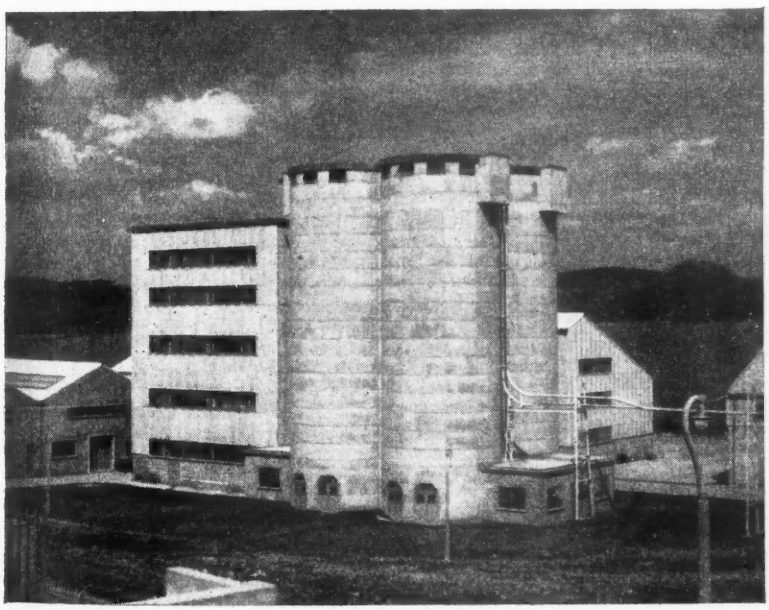
Minister of Works' View

THE Minister of Works, the Rt. Hon. Hugh Molson, MP, opened the new cement works of Associated Portland Cement Manufacturers at Cauldon Low, Staffordshire, on September 27. In his opening speech, Mr. Molson said: 'You will perhaps ask me what is the meaning of the Government's financial policy for the building industry and the many industries which produce building materials. I will try to give you a plain answer. Last year about £1,450 million of our capital investment went into new construction and another £650 million into maintenance. The Government believe that one main cause of rising internal prices and of a weak pound abroad is that we are trying to do too much in too short a time.

'It is natural therefore that we should regard a limit on construction as a necessary part of our plan to check the rise in prices and to maintain the external value of the pound. Of the £2,100 million spent on construction in 1956, some was undertaken by private enterprise, some by local authorities, some by the nationalised industries and some by the Government. I have stated them in inverse order to the Government's degree of direct control, but in one way or another we intend to prevent the expected increase of investment in each category. So far as the Ministry of Works is concerned, I am re-examining the building which we do at home and abroad to see what cuts can be made.

'Building Will Feel Effect'

'The building industry will feel the effect of these new measures. It is intended that it should. I introduced in April last fixed price tendering in an endeavour to interrupt the vicious spiral of increasing costs and wages in the building industry. The contractor is now expected to carry the risk of increased cost of materials or labour in jobs that are completely pre-planned and likely to be completed in two years. The reduction in jobs which will result from the 7 per cent. bank rate and from the other measures announced last week by the Chancellor of the Exchequer will obviously intensify the competition amongst civil engineering contractors and builders, and consequently amongst the manufacturers of building materials. I am hopeful that this will keep down the cost of building, but the output need not decline much if there is the necessary increase in efficiency from management and in effort from labour.'



CAULDON CEMENT WORKS.—The new works at Cauldon Low, Staffs, were opened on September 27. The new plant, designed by the Works Department of the Associated Portland Cement Manufacturers, Ltd., and G. and T. Earle, Ltd. (Oscar Faber and Partners, civil engineering consultants), were built by Geo. Wimpey and Co. Ltd., and will add an annual tonnage of 200,000 to the Group's productive capacity. The scheme has cost about £3½m. Our view shows the cement silos and packing plant building, including pneumatic cement transport pipelines. A feature of the plant, set in surroundings which have been carefully landscaped, is that the process uses less water than that in general use, and consequently less coal is required in manufacture

'Trend Towards Firm Price Tenders'

MR. T. RILEY, president, North-Western Counties Region of the Federation of Master Builders, speaking at the annual conference of the Federation's North-Western and Midland Regions, at Blackpool, on September 28, said that this was probably the first large conference of builders to be held since the Government had announced its drastic anti-inflation measures. 'The building industry cannot accept the view held by some people that building is a luxury service provided when all other important jobs have been done,' said Mr. Riley. 'Building is essential to the efficiency and prosperity of the country. Therefore, we ask that the less productive expenditure by the Government and local authorities be examined once again.

'The £1,500m. which is planned to be spent by public departments during the coming year on capital works is only a fraction of the vast amount of money spent on administration, subsidies, defence, social services, and so on. Far better, in my view, to cut this coat according to the cloth available, than to limit the work which can make our country economically strong and efficient. Every unproductive service should be reviewed before capital investment is curtailed or held down.'

Before the news of the increase in the bank rate and the restrictions on capital expenditure, Mr. Riley continued, 'many business-men and workers were suggesting that a moratorium or stand-still on prices would have given us the necessary breathing space to sort matters out. The Government had, however, decided to cut down demand for investment, first by making it more expensive; second, by restricting the amount of money available to pay for it.

'Many of you must feel that in time, if these restrictions continue, there will be a few more builders after slightly fewer jobs. Also, the trend may be towards more and more firm price tenders. Our reluctance to adopt such tenders has been occasioned by the unwillingness of the Government to do anything to stabilise prices. If these latest measures do bring greater stability, then the trend towards firm tenders would be to everyone's advantage.

'But we must warn the unions', the speaker added, 'that unreasonable demands

and the present agitation for a 40-hour week is clearly unreasonable—can only increase costs to nobody's advantage. Ours is not a factory industry. Possibilities of lighting for night working, of remedying the effects of bad weather, are severely limited. Everyone would like a 40-hour week with no loss of earnings; there are all kinds of other things we would like to have in this world, but the plain fact is we can only have what we earn, and the sooner this is realised the better.'

Municipalities Halt Schemes

Edinburgh Suspends Granting of New Contracts

BECAUSE of current conditions in the money market Edinburgh Corporation have suspended until November 4 the granting of new contracts for municipal projects. The decision was taken at a meeting of Edinburgh Town Council on September 26 on the recommendation of their Finance Committee. The City Treasurer, MR. J. G. DUNBAR, said they hoped the effects of the raising of Bank rate would be clarified within the next week or so.

The council defeated by 30 votes to 19 a Labour amendment which declared that the suspending of contracts had been made necessary by failure of the Government to take timely action on the nation's economic problems.

Battersea Withdraw Flats Scheme

BATTERSEA BOROUGH COUNCIL, on September 25, decided to withdraw a £143,900 scheme for the erection of 61 flats and maisonettes. MR. J. F. LANE, chairman of the Housing Committee, said the reason was the effect on building costs of the rise in Bank rate. The interest rate the council would have to pay for borrowing to build dwellings was not yet clear.

'If, as is possible, this council is charged three-quarters per cent. above Bank rate, the financial effect on building will be to render it impossible,' he said. 'To pay an increase of 2 per cent. on recent interest charges of 5¼ per cent. would add at least another £1 a week to the rents of modern flats, and make an economic rent £5 10s. a week.' He added: 'Such a rent could not be charged.'

Dawley Scheme Deferred

A DEPUTATION from Dawley Urban District Council met the Minister of Housing, Mr. Henry Brooke, on September 26, prior to his opening of an old persons' home in the town, and told him that because of the rise in the Bank rate the large Birmingham overspill scheme would have to be deferred. The Dawley Council had planned to build 3,000 dwellings, and the first part, the pilot scheme, was to have been the erection of 244 houses.

A special meeting of the housing committee was held on September 24 to consider the position, and it was unanimously agreed that construction of the 244 dwellings and roads and sewers should be deferred until the rate of interest charged on the money required was more favourable.

It was also decided that a resolution be sent to the Urban District Councils' Association, urging that representation be made to the appropriate authorities 'for a preferential rate of interest on loans for housing.'

Sale of a Practice

ARCHITECTS AND SURVEYORS IN DISPUTE

WHAT was described by counsel for the plaintiff as an 'unfortunate dispute' between two professional men over the sale of an architect and surveyor's practice at St. Leonards-on-Sea, Sussex, was the subject of an action at Clerkenwell County Court on September 25, in which a Chelsea architect sued a Hornsey architect.

Plaintiff was Mr. Norman James Rushton, LRIBA, architect and surveyor, of 21, Markham-street, SW3, who claimed the sum of £159 1s. 3d. from Mr. Kenneth S. I. Sinclair, ARIBA, of 44, Coolhurst-road, N8, as balance of payment in connection with the sale of the St. Leonards practice.

Outlining the claim, MR. ROGER GRAY, counsel for the plaintiff, said Mr. Rushton sold a small practice at St. Leonards to Mr. Sinclair for £300. Mr. Rushton carried on his main business in Chelsea, and he had bought the St. Leonards practice in 1952 from the executors of an architect who had been in hospital for a year before he died. 'There was not much doing in the practice when my client bought it, and in fact he bought it for £400,' said Mr. Gray, who added that at that time the value of the practice was more potential than actual.

Mr. Gray declared that Mr. Rushton would be the last to state that he built up a large and thriving practice at St. Leonards. It was a small practice and that was how he described it to Mr. Sinclair. About halfway through 1954, Mr. Rushton virtually closed down this practice and when Mr. Sinclair bought it at the end of 1955 or the beginning of 1956 it was right to say that there was no work, and the defendant was told that.

No Warranties

On September 19, 1955, said Mr. Gray, Mr. Sinclair and Mr. Rushton met at Markham-street, and Mr. Rushton said he wished to dispose of the practice for £300, including furniture and fittings. Mr. Rushton told defendant that there was practically no business when he himself took over, but that he had indeed taken some fees. He also told defendant there was no work in progress at the present time, but that there were two unfinished jobs which might be revived. Mr. Rushton gave no warranties or representations of any kind to induce the purchase, said Mr. Gray.

Both parties visited the St. Leonards office together on October 31, and it must have been quite obvious to defendant that nothing had been done there for some considerable time, as clearly the office had not been in use, Mr. Gray continued.

On December 2, Mr. Sinclair said he wished to purchase the practice and terms were discussed. In a letter to defendant on December 6, Mr. Rushton said he was prepared to sell lock, stock and barrel for £300—£150 down and the balance over the next 12 months, plus six per cent. interest, or alternatively in two equal payments spread over two years, again plus interest. Defendant's reply was that he accepted the offer on the terms stated and enclosed a cheque for £150 adding: 'While I shall hope to pay the balance within 12 months, plus six per cent. interest, I appreciate your alternative suggestion of spreading it over two years should it prove desirable.'

Mr. Gray said plaintiff's claim was for the whole of the balance outstanding, upon the basis that the first instalment was not paid after a year and therefore the whole amount was now due.

Mr. Gray said a counter-claim for £260 damages had been entered by Mr. Sinclair, who alleged that Mr. Rushton had told him there was an existing practice, that certain warranties or representations made by Mr. Rushton were broken or untrue, and that plaintiff had said there was a number of useful clients on the books.

Came to Nothing

MR. RUSHTON, in evidence, said he was a past-president of the Faculty of Architects and Surveyors, a licentiate of the Royal Institute of British Architects, and had 45 years' standing as a qualified architect and surveyor, having also been a former member of the Architects Registration Council—the governing body of the profession. Plaintiff said when he purchased the St. Leonards practice in 1952 there was no work being actively conducted, but there were two potential jobs waiting to be revived, but these ultimately came to nothing. No value was placed on furniture, fittings and equipment when he sold to Mr. Sinclair, but he would put a value of £150 on them.

Mr. Rushton stated that from January 14, 1952, to December 31, 1955, he took a total of £2,465 in fees. For the first two years he had had an assistant there but terminated her employment in May, 1954. 'During 1955 the practice could not be described as active—very largely because I had no wish to become involved in further work.'

Mr. Rushton, describing the discussion of the practice with Mr. Sinclair in September, 1955, said he told defendant it had become a burden to him and he wanted to dispose of it. He explained to Mr. Sinclair that there was nothing but a potential there, and it was in much the same condition as when he (plaintiff) took it over. 'I never said it was a busy practice—a fact which could have been verified immediately had I made such a statement. I did my best to give him as faithful a picture of the situation as possible,' said Mr. Rushton, who added that he had no recollection of telling defendant there was a number of useful clients on the books.

Plaintiff stated that the word 'goodwill' cropped up during the discussion, but he himself was not taking that into account. If defendant thought there was any goodwill, then it was covered by the £300. 'I do not think, as an architect, that I misled Mr. Sinclair in any way,' said Mr. Rushton.

In reply to MR. GRAY, who referred to a claim by Mr. Sinclair that plaintiff had promised him he would not be required to pay the balance of £150 unless and until he had made sufficient profit out of the practice, Mr. Rushton maintained that he made no such arrangement.

In a lengthy cross-examination by MR.

ALAN BRAY, for the defendant, Mr. Rushton denied telling Mr. Sinclair there was a number of useful clients on the books of the practice. He admitted that he did no work for any client at St. Leonards for which he charged, during 1955.

MR. BRAY: 'You allowed Mr. Sinclair to have a completely wrong impression of the nature of the business?'

MR. RUSHTON: 'I cannot say whether I allowed him to get a wrong impression. I did nothing to give a wrong impression.

MR. BRAY: 'With your experience, did it not occur to you that you should take particular care with a young architect who was buying a practice that to all intents and purposes had been dead for over a year?'

MR. RUSHTON: 'I did not regard him as a young architect. I understood he had been in practice for several years. He was quite confident he would have no difficulty in making the practice go. I would suggest that the sum I was asking in no circumstances could be expected to be a price for a flourishing business.'

At the close of Mr. Bray's cross-examination, Judge Reginald Clark, QC, adjourned the case for want of time to a date to be fixed later.

GUILDFORD HIGH STREET

Problem of Shopfronts

CONCERN about control of the design of contemporary shopfronts in the town's picturesque High-street was expressed at Guildford Town Council meeting last week. This arose during a discussion on a minute of the Town Planning Committee relating to the new shopfront at 138, High-street, the premises of Cardinal Cleaners.

It was explained that the plans were submitted to an advisory panel, comprising four architects. In this case the developers accepted some amendments suggested by the panel, and on the advice of the panel the committee decided, 'a little reluctantly,' to accept the plan put before them.

The minute of the Town Planning Committee stated in regard to this particular shopfront, that the borough surveyor reported that the stallboard was in mosaic, instead of the eggshell black shown in the plans approved by the Council. In addition, lettering, illuminated by neon lighting, was prominently displayed in the shop window. The applicants had apologised for not informing the Council of these matters, but had asked for the Council's approval.

It was recommended and the Council agreed that they should not allow any departure from the plans as originally approved, and that the persons concerned should be requested to submit an application for the display of the lettering in question.

MR. E. B. NICKLIN said he had seen various buildings and shopfronts going up in the High-street and had been depressed by them, feeling that they had not been in accord with his idea of good taste. This particular place was near the Guildhall, and he felt that either the panel of architects or the Town Planning Committee were not doing their job. He had been told that the committee passed plans, and when in their opinion the panel did not put in a practical suggestion there was a certain amount of compromise. If that was so it was wrong. They should rely on the panel and not try to compromise.

MR. R. M. HARDY, the Town Planning Committee's vice-chairman, pointed out that the committee took the responsibility for any building that went up, with the exception of those disapproved in which, on appeal, the Minister reversed the decision of the Council.

Explaining the system regarding plans for buildings in the central areas of the town and for new shopfronts and fascia boards, he said that anything connected with the alteration of frontages had been referred to the panel of architects—local architects appointed from the local chapter—and the Council had no jurisdiction over that body. The Council had, in the past, without exception, accepted their advice on all cases they had brought before them.

There were four members of the panel, and presumably they had different approaches to each problem. From their deliberations came the suggestions for modifications which were proposed to the developers.

Dealing with the case in question, Mr. Hardy said the plans went before the panel. Various amendments were suggested, and the developers accepted them. The plans then came before the committee. Some of the members were not in favour of approval but, bearing in mind the policy of accepting the advice of the panel, the committee decided, a little reluctantly, to accept the plan put before them. That was how it had gone through.

(In a recent talk to Guildford Rotary Club—*The Builder*, September 13—Mr. John Brownrigg, ARIBA, a local architect, discussed problems of planning contemporary building in Guildford and of obtaining agreement among architects on what was best to be done.)

NUFFIELD FOUNDATION

Twelfth Report

THE Report of the Nuffield Foundation for the year ended March 31, 1957, issued from Nuffield Lodge, Regent's Park, London, NW1, records research into a variety of subjects related to architecture, engineering, technology, social welfare, etc.

In the Division for Architectural Studies (Director, Mr. R. Llewelyn Davies, ARIBA), a survey in which 116 children's wards in nine children's and 23 general hospitals are taking part, will establish over the course of a year the number of children who were (a) isolated, (b) confined to bed though not in isolation, and (c) allowed to get up for all or part of the day. This data will give guidance as to the sort of accommodation likely to be needed in children's wards.

In collaboration with the Northern Ireland Hospitals Authority, plans have been developed for a central sterilising department to serve Musgrave Park Hospital, Belfast (600 beds). The department will be housed in the experimental block designed by the team of the investigation into the functions and design of hospitals, and will be the first of its kind in the United Kingdom.

The team engaged in the study of laboratories has completed its survey into the utilisation of space and services. Studies of daylight conditions in laboratory rooms made jointly with the physics division of the Building Research Station have also been completed. The Division has undertaken to prepare plans for a small Agricultural Research Council laboratory at Cambridge, which will give the opportunity to demonstrate and test some of the conclusions of the study.

Two young architects, post-graduate fellows working with the Division—Mr. Peter Wixon and Mr. Newton Watson—have worked together on a design project for a small maternity unit to be attached to the Nuffield Diagnostic Centre at Corby.

In the field of technology, research is to be carried out in the Department of Engineering at the University of Cambridge, under the direction of Mr. D. L. Marples and Mr. J. L. Reddaway, into the training of design engineers. The project may take three years to complete.

Under social research and experiment, the Royal Institute of Public Administration has been made a grant of up to £2,250 a year for a period not exceeding two years to help in a comparative and critical study of how local authorities organise their building construction and maintenance. In 1954-55 local authorities spent about £350 millions on the construction of houses, schools and other buildings, and they are big landlords who have to spend large sums on maintenance. The research officer is investigating the administrative arrangements in a number of local authorities of different sizes and kinds, in association with a steering committee composed partly of members of local authorities and senior professional and administrative officers and partly of people familiar with building work outside local government.

The Foundation has allocated £2,350 for the first year of an investigation now being carried out by Dr. James Mackintosh into the damage done to community buildings, children's playgrounds, shrubs, trees and grass verges by adolescents or very young children in the new towns; £800 was contributed towards a venture known as 'Shanty Town,' promoted by the Grimsby Adventure Playground Association with the idea that children would respond in a social way to opportunities for constructive activity. The children are said to have developed their 'dens' into a 'community,' with its own hospital, fire department, police station, hotel, a sandpit and house for the under-fives. The children run a hut canteen for which they do their own shopping, they organise their own activities, and sweep and tidy the hut (40 ft. by 20 ft.) each night. The idea appears to be working.

A grant of £3,700 a year for a further two years has been made to the University of Bristol, Department of Psychology, for research into the employment of older workers in the engineering industry.

The foregoing are only a few items from a most interesting report.

LOANS TO LOCAL AUTHORITIES

New Interest Rates

THE Ministry of Housing and Local Government announce that the following rates of interest shall apply to all loans advanced to local authorities, as defined in Section 10 of the Local Authorities Loans Act, 1945, from the Local Loans Fund as from September 28, 1957:

Loans for not more than 5 years	7¼ per cent.
Loans for more than 5 years but not more than 15 years	6¾ per cent.
Loans for more than 15 years ..	6¼ per cent.

LCC Public Health Department Report

PAINTS AND BUILDING MATERIALS

A REPORT has been published on the work of the Scientific Branch of the LCC's Public Health Department for 1956, submitted to the Council by Dr. S. G. Burgess, their scientific adviser.

In a section devoted to 'Paints,' the report states: 'The scientific branch continues to provide an advisory service to all departments of the Council on all aspects of decoration and protection by paints and other surface coatings. Advice is constantly being given at all stages—during the drafting of specifications, before and during painting and when difficulties or breakdowns occur. Difficulties on site continue to be caused more by faulty application than by inferior paint. The efforts of the branch to raise the quality of paint used by the Council have been very successful, but there remains much to do to raise the standard of painting of some contractors.'

During the year 83 new brands of paint were approved after test while a further 84 were found not to be of the quality required. Low opacity, poor surface finish or hardness, and the presence in exterior paints of excessive amounts of chalk were among the causes of rejection.

Reasonably Constant

Commenting on the fact that while the number of rejections had remained reasonably constant the reasons for rejection had altered considerably, the report says. 'Manufacturers appear less inclined to put lithopone into exterior paints in view of the absolute certainty that this will be detected and thus lead to rejection: calcium carbonate in undesirable quantities as an extender has, however, become slightly more prevalent probably due to the increased use in the grade of surface-treated calcium carbonate as an anti-settling agent. No objection is taken to the use of anti-settling agents in reasonable quantity but calcium carbonate figures of up to 40 per cent. in exterior undercoats still continue to be recorded.

'The growing tendency in the trade to produce paints which comply with the Council's known requirements and also with the Government paint specifications has led to improvements in respect of opacity and scratch hardness, but this has been offset, as a result of increasing pigment loadings and using harder media, by a very marked increase in the number of paints showing poor flexibility—particularly, in exterior undercoats where flexibility is a very important and necessary property.

'The increasing number of paints rejected on account of poor surface finish—bittiness, grittiness, poor grinding, contamination or other surface defects—probably reflects the growing number of small firms making a first application to be admitted to the approved lists, and which are unable to exercise such rigid control on their products as the larger manufacturers.'

The section of the report dealing with 'Building Materials' shows that the range of materials received for examination included floorings, floor sealers and polishes, plasters, light alloys and plastic building materials, fire retardants, concrete, slates, asphalts and bitumen felts.

Some interesting defects investigated during the year are given as follows:

(*a*) Small rust stains on precast concrete pillars painted with emulsion were found to be due to small particles of iron transferred from the moulds to the pillars during casting.

(*b*) Discoloration of a flat paint used on a school ceiling was traced to the acidic fumes from gas space-heaters reacting with an acid-sensitive dye stuff in the paint.

(*c*) Failure of paint work on an asbestos balcony panel was found to be due to the high water-susceptibility of the alkali-resistant primer used.

(*d*) Several cases of failure of paint on steelwork were found to be due to incomplete removal of mill-scale.

(*e*) The use of emulsion paints over water-based (i.e., glue or casein-bound) texturing paint was found to lead to rapid breakdown under humid conditions, due to the high water-permeability of emulsion paints.

(*f*) A yellow discoloration of a cellulose varnish applied over a large photograph was found to be due to the delayed action of a pyrethrum-type insecticide carelessly used.

(*g*) Pattern-staining of an emulsion paint on a vermiculite plaster wall was found to be due entirely to water retention in the wall after several months of occupation.

(*h*) Great difficulty was experienced in painting the inside faces of gas-heated drying cabinets, which needed a paint system able to withstand heat, moisture, acidic fumes from gas combustion and local high alkalinity from imperfectly rinsed clothes. A system involving a calcium plumbate primer and an aluminium paint was proposed and is satisfactorily undergoing trials.

Concerning the increased importance of tests on samples of clay and ground waters from building sites with the construction of high blocks of flats in housing schemes, it is stated: 'The presence of sulphates in London clay can lead under moist conditions to the gradual disruption of concrete. The settlement of buildings owing to the weakening of the foundations, even if slight, can be serious in effect.

Susceptible Foundations

'The deep piled foundations of blocks of flats are particularly susceptible since the surface area of the concrete is large in comparison with its volume. The examination of soil and water samples from trial holes on building sites, for the presence of deleterious salts, is an important preliminary step taken before deciding on the type of cement most suitable for foundations.

'The numbers of these samples increased by 40 per cent. over those of the previous year. Sulphate attack is more rapid if the concrete is weak, and considerable protection is obtained even in Portland cement concrete by the use of a well compacted strong mix. On the other hand in the presence of high concentrations of sulphates High Alumina Cement may have to be used.

RIBA

Sessional Arrangements

The programme of arrangements for the ordinary general meetings and lectures in the 1957-58 session of the RIBA has now been published. The session opens on October 29. Meetings at 6 p.m.

October 29. First lecture on *' Problems of Building on Moving Ground ' by Mr. Donald E. Gibson, ARIBA.
November 5. President will deliver his Inaugural Address, after which he will present the London Architecture bronze medal to Messrs. Chamberlin, Powell & Bon.
December 10. Paper on 'Architectural and Building Requirements as Related to Atomic Energy ' by Sir John Cockcroft, OM, KCB.
January 7. Announcement of Award of Prizes followed by a discussion on 'Architecture and the other Arts.'
January 21. Lecture on *' Public Parking Garages ' by Sir Herbert Manzoni, CBE, MICE.
February 4. President's Address to Students followed by criticism of Students' work by Mr. P. F. Shepheard, ARIBA. Prize presentation.
March 4. Paper on the ' Architect's Role in Society ' by Sir John Wolfenden, CBE.
March 25. *' Domestic Building and Speculative Development ' by Mr. E. Lyons, FRIBA.
April 15. Presentation of Royal Gold Medal.
May 6. Annual General Meeting.
May 14-17. British Architects' Conference.
May 20. 'The Passing Show ' by the Hon. Humphrey Pakington, OBE, (Rtd. FRIBA).
June 17. Results of Council Elections followed by talk on 'The Problem of Technical Information ' by Mr. E. L. Bird, ARIBA.

*Science Lecture.

CAPITAL EXPENDITURE

Estimates of Building Work

ESTIMATES of fixed capital expenditure by manufacturing companies for 1957 and 1958, published in the *Board of Trade Journal* of September 20, indicate decreases in the amount to be spent on building work.

Compared with their revised estimates of expenditure during 1957, companies' provisional estimates of their expenditure during 1958 indicate a decrease in total expenditure of 5 per cent., with expenditure on building work 9 per cent. lower and on plant, machinery and vehicles 3 per cent. lower. Estimates for 1958 are described as 'very provisional,' and taking past estimates into account it is expected that fixed capital expenditure in 1958 will, in fact, be about the same as in 1957.

Revised estimates of expenditure during 1957 indicate that manufacturing companies will spend 7 per cent. more than they planned to spend in 1956, compared with an earlier estimate of a 1 per cent. increase in 1956. Expected expenditure on building work has, however, been revised downwards (the largest revision being by companies in the chemical and allied trades and in clothing and textiles), and it is expected to be 10 per cent. lower than expected expenditure during 1956. The earlier estimate was of a decrease of 7 per cent.

Many companies have now made returns of their actual expenditure during the second quarter of 1957. For the first half of this year the estimate of actual expenditure on building work is of a decrease of 5 per cent. compared with the second quarter of 1956; the first quarter of 1957 showed an increase of 16 per cent. over a year earlier and for the first half of 1957 there was an increase of 5 per cent. This compares with the estimated decrease of 10 per cent. for the whole of 1957.

LMBA

Recruiting for the Industry

SPEAKING at the September meeting of the LMBA's North-Eastern Area at Stratford last week (under the chairmanship of the Area chairman, Mr. H. J. Horn), MR. D. E. WOODBINE PARISH, a former president, said that a far more positive approach was needed towards the recruitment and training of men for all grades in the building industry. It was short-sighted, as well as amoral, for firms to avoid their individual responsibility for training future personnel.

Building presented particular problems of employment, and this imposed on all employers a personal responsibility to make a collective contribution. The building industry required a skilled and balanced labour force, together with a body of well-trained and experienced supervisors, administrators and managers. This would not be achieved unless full use were made of the educational facilities now available to the industry. It was the duty of each employer to know about these facilities and to have a long-term policy on recruitment and training.

Building employers had an inescapable responsibility to see that there was always a steady flow of suitable entrants to the industry and to provide the widest possible opportunities for these entrants to gain both practical experience and appropriate qualifications at Technical Colleges. Encouragement and guidance must be given to all employed in the industry to exploit their individual capacities and abilities to the full by formal study, be it in the field of craftsmanship, supervision or management.

The range of courses offered for all grades of the industry was considerable, but full use was not being made of the facilities provided. The Government's recent White Paper on Technical Education rightly stressed the need for more dynamic action on the part of employers in raising the standard of efficiency at every level of industry.

Youth Employment Officers to Visit Building Site

YOUTH EMPLOYMENT OFFICERS from the London Region are to visit a building site as guests of the LMBA on the afternoons of October 8 and October 9.

The visit is the result of a suggestion made by the chairman of the London Regional Joint Apprenticeship Committee, Mr. K. J. Pearce, at the recent conference between the LMBA and the youth employment officers. As youth employment officers are being urged to bring the attractions of building as a career to the notice of boys leaving school, the chairman suggested that it would be a good scheme if they could see apprentices in the various crafts at work on the job.

The site selected is the extension to Guildhall at the junction of Church-alley and Basinghall-street, which Trollope & Colls are carrying out. It was chosen because of the substantial number of different crafts to be seen on the job.

Visits were arranged on two days so that a maximum number of youth employment officers could have the opportunity of seeing the building industry at work.

COVENTRY HOUSING

Proposals for Negotiated Tenders

A SUBSTANTIAL part of Coventry's housing programme has in the past been achieved by negotiation, but the housing committee now wishes to secure competition for contracts in the central redevelopment area, and in so far as normal housing is concerned, proposes to do this by providing bills of quantities and full working drawings for normal tendering. There are, however, two sites for which multi-storey development is required immediately, and for which the committee wishes to ensure that the time spent on the preparation of drawings and specifications is reduced to a minimum so that development can commence in about six to nine months' time or even less. This requires collaboration between the contractor and the architect, both contributing to the technical work, but it is not considered reasonable to ask several contractors to compete on this basis, because of the extensive abortive work involved for all the contractors except the successful one. The committee is therefore seeking to introduce an element of competition by interviewing interested contractors to see whether they have the technical resources and to decide in the light of answers to questions and the subsequent submission of a priced schedule of rates which contractor should be chosen for these two contracts on a negotiated basis. There are various specialist methods of construction available and, with this in mind, it is proposed to issue an outline plan illustrating the type of accommodation required and the elevational treatment. If, therefore, the contractors have their own specialist method of construction it will be possible to apply this to the plan and to comply with the outline specification of finishes and quality of workmanship. With the information supplied, a contractor may be able to estimate the probable unit cost of accommodation (viz., of a one-bedroom flat or two-bedroom maisonette), which will be read in conjunction with his schedule of rates.

Contractors Interviewed

The committee has interviewed representatives of the undermentioned national and local building contractors, to whom the procedure proposed to be followed was explained and who answered questions put to them by the committee: John Laing and Son, Ltd.; Unity Structures, Ltd.; George Wimpey and Co., Ltd.; K. B. Benfield and Co, Ltd.; Garlicks, Ltd.; F. Hocking and Sons, Ltd.; W. H. Jones and Son, Ltd.

The committee resolved that the City Architect, Mr. A. G. Ling, FRIBA, be requested to supply the above-mentioned building contractors within one month with an outline plan, an unpriced schedule of rates and an outline specification of finishes, that the contractors be requested to submit a priced schedule of rates and an estimate of the unit cost of construction within six weeks of the receipt of the documents from the City Architect, and that the City Architect be requested to submit to the committee as soon as possible thereafter a report.

FOREMEN'S RESIDENTIAL WEEK-END COURSE

Accident Prevention Films

THE question of safety in the building industry was given prominence at the recent Residential Week-end Course for General Foremen, held at Moor Park College, Farnham, Surrey, organised by the Southern Counties Federation of Building Trades Employers. Two films on accident prevention were shown and following this questions were answered by a panel.

Thirty-five general foremen took part in the course, the first of a series on a higher level than previous ones, which a total of some 250 foremen in the Southern Counties Region have already attended. In welcoming them, MR. L. A. WALDEN, FIOB, president of the National Federation of Building Trades Employers, referred to the continued success and popularity of the various residential week-end courses. He also drew attention to the development of foremanship courses at Technical Colleges, particularly the two-year course leading to a City and Guilds of London Institute examination.

The highly-concentrated programme of lectures and discussions also included sessions on 'Work Study,' by Mr. K. C. M. Symons (Advisory Service for the Building Industry); 'Concrete Practice,' by Mr. R. M. Edwards (Brixton School of Building); 'Site Control of Labour, Plant and Materials,' by Mr. J. T. Elliott (Messrs. James Longley & Co., Ltd.); 'Programming and Progressing Jobs,' by Mr. W. F. Brockfield (Messrs. Y. J. Lovell and Son Ltd.); 'The Contract and Bills of Quantities,' by Colonel J. B. Marks, OBE, FRICS, and 'How Research Helps the General Foreman,' by Mr. H. J. Eldridge, BSc (Chief Experimental Officer, BRS).

'BACKBONE OF THE INDUSTRY'

Tribute to Builders' Foremen

MR. W. KIRBY LAING, president of the LMBA, speaking at the Annual Ladies Festival of the London Builders' Foremen's Association held at the Connaught Rooms, Great Queen-street, WC2, on September 28, described builders' foremen as 'the backbone of the industry and men on whom employers rely to a tremendous degree.'

Mr. Laing went on to list what he considered to be the six attributes of good foremen. 'First of all they must be diplomats—after all it takes quite a bit of diplomacy to ensure that the architect or engineer does not visit the site while something, which fell down during the night, is being put back. Second, they must be legal experts as building contracts are rather involved nowadays and need a great deal of understanding. Third, they must be able to read a drawing and some of them are not very readable either. Fourth, they must be first-aid experts—on men as well as machines. Fifth, the most important attribute of all, they must be practical builders and, sixth, they must be psychologists.'

MR. F. J. BEACH BARNARD, president, responded.

MR. W. F. SIMPSON proposed the toast to 'The Ladies,' MRS. W. KIRBY LAING responding.

FIRM PRICE TENDERS

Comments of Building Materials Producers

TO ascertain the views of suppliers in regard to the Government's decision announced earlier this year that their future building contracts will contain a two-year price stability clause, Associated Builders Merchants, Ltd., recently addressed a questionnaire on the subject to a number of leading manufacturers of building materials and components.

In their letter to the firms concerned the Association said that it would appear that the producer could accept responsibility for stabilised production, but that the following points, on which comment was invited, were beyond his control:

(a) *Inflation.*—This could to an extent be covered by relating any quotation to the price of gold.

(b) *Labour.*—Settlements are largely influenced by the Government and inflation follows.

(c) *Raw material price.*—This is also controlled by inflation and, to an extent, by Government raw material stocks, withheld or released by them, so affecting the market (e.g., their contemplated release of copper).

(d) *Legislation.*—This, whether here or abroad, can have outstanding effects on production costs.

(e) *Buying responsibility.*—Whether, if prices slumped, the buyer would carry out his contract.

(f) *Bankers.*—They would probably look askance at the account of anyone giving a two-year guarantee of price stability without qualification.

It may be that acceptance of two-year contracts can become a possibility, if qualified by factors associated with (a) to (e), the Association's letter continued. The long-term risk involved obviously varies with the type of supplies which are used in a building contract, some types being delivered within six months, whereas the supplies peculiar to the merchants' side of the trade are the last ones to be delivered.

The replies, state the Association, in general, emphasise that the main impossibility of giving firm prices for such a period must be attributed to the points (a) to (f) in the inquiry.

Some go out of the way to elaborate on the issues:—

(a) *Inflation.*—Two challenge the value of tying quotations to gold 'inasmuch as the gold price has not altered for some years.' They overlook that sterling, by agreement, is tied to the dollar, which is based on gold. If we devalued, there would be a prompt alteration. A certain weakness has recently been apparent with the USA dollar *v.* the Canadian. There is general agreement that to increase prices to cover the risk is definitely inflationary.

(b) *Labour.*—The initial responsibility of the National Union of Mineworkers, the National Wages Board and the National Coal Board is emphasised under this head. Attention is drawn to the impossibility of foreseeing wages increases.

(c) *Raw Materials.*—The inflationary policies of the nationalised coal, electricity and gas industries have exercised an outstanding control on raw materials.

(d) *Legislation.*—Many point out the impossibility of anticipating Government action. (This comment was made before the announcement of a 7 per cent. Bank rate.)

(e) *Buying responsibility.*—Several point out that a slump in prices would be followed by the dishonouring of buying commitments, even in high circles.

(f) *Bankers.*—This aspect, based on the credit squeeze, is commented on.

Apart from these generalities, attention is also drawn to the following points:

(1) 'Profits insufficient to anticipate rises.'

(2) 'Prices stabilised by us in 1956 resulted in loss.'

(3) 'Raw material is controlled politically.'

(4) 'The Government put the cart before the horse. They should stabilise (a) to (e) before they ask industry to do the impossible.'

(5) Quite a number place the actions of nationalised industries as having been the earliest and major cause in creating (a) to (e).

Having secured, at high level, such unanimous views, ABM, Ltd., approached the insurance market for a rate to cover the risks involved. They replied that such a risk was uninsurable. They pointed out that in effect it assumed the character of a financial guarantee.

INCENTIVES IN THE BUILDING INDUSTRY

Questionnaire to Foremen

THE following series of questions and answers on the subject of incentives in the building industry, which is addressed primarily to foremen, has been sent to us by Mr. T. G. H. Wells, AFS. The matter arises from the current correspondence in *The Builder* on this subject which was started by the publication (see *The Builder*, August 16 and 23) of a Building Research Board paper on the problems of incentive bonusing.

Questionnaire

Q.—*Is bonusing necessary?*

A.—Yes. Most responsible opinion agrees that increased production (labour output) is our sole hope of progress or indeed, of existence in present and future circumstances. Bonusing is the 'carrot' that has supplanted the 'whip,' creating a situation which, whether welcomed or not, is a challenge to all.

Q.—*What are Incentives?*

A.—Briefly, in our industry, of two kinds, controlled or uncontrolled. Uncontrolled means plus rates and 'gift' overtime. Controlled is that developed from allocation data supplied by foremen and leading hands. This is not reckoned to be an exact science, but then neither is estimating.

Q.—*Why is our foremen's co-operation desirable?*

A.—Because where it exists the results over two years have been very encouraging. Where close co-operation was not possible the system was often still workable but obviously less accurately.

Q.—*How does our system work?*

A.—Full details and the services of the surveyor are always available, but briefly: (a) Targets are supplied on request; (b) allocation and measurements agreed with site or responsible operative, and assessed by surveyor; (c) payments by wages department, consistent with preparation of paysheets by the Tuesday.

Q.—*But I have enough office work without allocation!*

A.—From experience, allocation appears to take about a quarter of an hour per day but foremen on larger jobs often delegate it to their leading hands, just keeping a watching brief themselves.

Q.—*What relations have 'Targets' with the 'Bill of Quantities'?*

A.—Varying. The bonus surveyor will often propose his own 'constants' available for most operations and often closely allied to the bill. However, the operative is not concerned with the estimator's 'fat' or 'thin' prices, hence, as somebody has to 'stick out his neck' it is usually the bonus surveyor.

Short Answers to Pertinent Questions

Q.—*Who are the chief objectors to incentives and why?*

A.—Generally prejudiced people or 'flat earthists.' (The writer has some sympathy with them as he does not believe in the aeroplane either!).

Q.—*It encourages shoddy work?*

A.—Bonusing does not relieve foremen of supervision but it has helped in their absence.

Q.—*What about the difficult trades such as plumbing?*

A.—The MoW failed to tackle this in PBR days but we have had some success where co-operation existed.

Q.—*Is the bonus always earned?*

A.—Substantially so, as supported by overall results, but sometimes the surveyor will exploit the psychological effect of an 'improvement' payment. The slacker who enjoys a share of a gang bonus is subject to correction by foreman or gang.

Q.—*Does allocation question the foreman's efficiency?*

A.—No. Work not directly productive is headed 'other work' and gives an appreciation of the site difficulties. A simple sheet is compiled by the foreman or leading hands.

COMPANY NEWS

Universal Asbestos Manufacturing Co., Ltd., have declared payment of an interim dividend on the ordinary shares of the company of 4½d. per share, less tax, for the year ended September 29, to be paid on October 8.

National Smoke Abatement Society

ANNUAL CONFERENCE, HASTINGS

THE annual conference of the National Smoke Abatement Society, which is being held at Hastings from October 2-4, was opened by the Mayor of Hastings, Alderman F. J. Hussey, after which Dr. R. Lessing gave his first presidential address.

In the course of his speech DR. LESSING said that the solution of the domestic smoke problem demanded the replacement of house coal in open grates by smokeless fuel or the installation of modern appliances. In industry the 40,000 hand-fired boiler furnaces must be fitted with, or replaced by, mechanical stokers suitably instrumented and competently operated.

Speaking of grit and dust discharged from the country's chimneys, he said it was his contention that a large, if not a major portion, was derived from the 'natural' dust in coal. If the National Coal Board could be persuaded to incorporate dedusters in their coal preparation scheme, the problem of dust arresting on thousands of boiler plants would be eased and emission diminished. By pneumatic dedusting coal prior to washing, the slurry nuisance would be abated. Moreover, the burning of slurry resulted in an appreciable dust emission, whilst the product from dedusters would find a satisfactory outlet in pulverised fuel plants.

Dr. Lessing pointed out that he had drawn attention to the potential dust nuisance from pulverised fuel firing as long ago as 1923. The quantity of coal fired as powder had now risen to well over 20 million tons per annum. Even with an extraction efficiency of 99 per cent., which was by no means generally achieved, more than 100,000 tons of flue dust escaped into the atmosphere. To reduce this amount, and incidentally lighten the load of the precipitators, he suggested that a substantial portion of the high ash part of the 'untreated smalls' used by power stations and other large works should be removed at the colliery.

Sulphur Oxides

The avoidance of pollution of the air by sulphur oxides was perhaps the most intractable subject they had to consider, he continued. The difficulty and expense of extracting them once they were formed had militated against a general adoption of methods for flue gas treatment. They had reluctantly to admit that the sulphur inherent in the pure coal substance could not be removed, except partially in the carbonising process. However, by appropriate preparation, a substantial portion of high sulphur refuse could be washed out from the raw coal.

Dr. Lessing said that he offered no excuse for reiterating the theme of extensive and intensive coal cleaning. He could not accept the customary objection that it was 'uneconomic' since the recovery of the heat value and sulphur from the washery discard has been made possible by modern means. In the production of gas coke and low-temperature coke, the removal of sulphur at the colliery had the added advantage of a lowering of the ash. The drive for a wide domestic use of smokeless fuels would succeed only if the housewife's daily chores were eased.

Dr. Lessing had begun his address by referring to the long history of the Society and its two predecessors, the Coal Smoke Abatement Society and the Smoke Abatement League, and his own long association with them, dating back to well before the first World War. At the end of his address he spoke of the future of the Society, pointing out that it was now recognised that air pollution was not restricted to invisible smoke, and the decision of the Society was to be welcomed, that it should change its name to the National Society for Clean Air. This development, combined with the Society's application for incorporation, was highly significant for two reasons. First, the Government-approved constitution enhanced the status of the Society, and, secondly, the more comprehensive title widened its scope and set new tasks.

The Clean Air Act

Thursday morning's session of the conference was devoted to three papers on the 'Administration of the Clean Air Act, 1956.' The chairman was Mr. John Innes, Chief Sanitary Inspector of Paisley, and President of the Society's Scottish Division.

The first paper, on 'Some Points on its Practical Application' was given by MR. M. LINDSAY TAYLOR, Town Clerk of Tottenham. He said that so far as local authority members were concerned, the functions of the Act were so closely connected with Public Health that the Public Health Committee would be the obvious choice of a committee to which the work of administering the Act should be entrusted. Except in very large authorities and in areas where sub-committees were freely utilised, it should not be necessary for a sub-committee to be specially set up for this purpose.

He went on to speak of the several possible ways by which local authorities could co-operate in the implementation of the Act. This could be done by the total relinquishment by several local authorities of all their power under the Act to a Joint Committee under the Local Government Act; or by the combination of two or more authorities for the purpose of declaring a smoke control area; or, lastly, an exchange of information between adjoining local authorities with a view to co-ordination of method. He gave a number of examples of co-operation which were already taking place between local authorities.

The next paper, entitled 'A Critical Survey,' was given by Mr. G. Graham Don, Lecturer in Public Health, London School of Hygiene and Tropical Medicine. MR. DON said that the smoke control area was the backbone of the new attack on air pollution. It was the first organised attempt to tackle the problem of the domestic chimney and the approach was a positive one. The development of the slow combustion domestic grate, suitable for burning smokeless fuel, was one of the most promising post-war advances in housing.

Mr. Don went on to ask whether the present accepted principle of starting a smoke control area in a city centre was the right one. It was suggested that an area should be large enough for the inhabitants to see a positive benefit from their abstention. The innovation of a green belt was now well established; could we now enforce a clean air ring around our cities, extending gradually towards the centre? Suburbia had normally little industry and might well be an area where good results would most readily be seen and appreciated.

He also asked if, by a similar process of reasoning, there was not an argument for dealing first with areas where little smoke was produced. In a rural county the pollution from a single chimney was an even more obvious desecration of the landscape than a smoky chimney among its fellows in an industrial area. Air pollution was a problem within the wide field of preventive medicine and the prevention of new sources of pollution was at least as important as the elimination of the existing ones.

The third paper given was a report on 'The Availability of Smokeless Fuels,' prepared by Mr. Arnold Marsh, Director of the Society, on the instructions of the Society's Executive Council. MR. MARSH said that over 100 local authorities were considering plans for smoke control areas, and over 30 Orders had been drafted and submitted to the Minister for approval. As far as numbers were concerned, this might be regarded as satisfactory, but the aggregate area fell very short of the annual target of 300,000 acres, or 1.5 million tons of coal replaced, envisaged by the Beaver Committee. He thought that in many cases the cost of grants for conversions was causing misgivings, which were leading to a very cautious and slow-moving policy. The burden on the rates could be seen; the savings in cash, health and amenities were more difficult to appreciate and accept. 'It is still not generally understood that it is much cheaper to spend money on clean air measures than not to do so,' he continued.

A Mistaken Belief

Another reason given by Mr. Marsh for the fact that some authorities were holding back, was the mistaken belief that they would be unable to take any action at all against industrial smoke until the end of the temporary (seven years) defence relating to structural changes in industrial plants.

Really satisfactory progress depended on local authorities planning smoke control areas on a scale which, because they threatened to cause a real shortage of smokeless fuel, might have to wait for some years before they could be established. Mr. Marsh ended his report by saying: 'It must be remembered that Orders will not be given Ministerial approval unless fuel supplies are adequate, and a long queue of such Orders waiting for approval is, perhaps, the best way of ensuring that production is being continuously expanded.'

BOOKS RECEIVED

PRACTICE AND PROCEDURE FOR THE QUANTITY SURVEYOR. 2nd revised ed. By Arthur J. Willis, FRICS. (London: Crosby Lockwood & Son, Ltd.) Price 25s.

FABRICATING HOUSES FROM COMPONENT PARTS. By N. Cherner. (London: Chapman & Hall.) Price 64s.

STRUCTURE OF THE BUILDING INDUSTRY

Mr. Parish's Talk to Foremen

THE structure of the building industry and its position in relation to the economy of the country was surveyed by Mr. D. E. Woodbine Parish at the September meeting of the London Association of Builders' Foremen and Clerks of Works, held under the chairmanship of its President, Mr. H. Palmer.

In his opening remarks MR. PARISH defined the basic objective and function of the building industry as the provision of the maximum quantity and quality of all types of new buildings required by the community and the maintenance of existing property with the minimum use of real resources be they human or material.

The marshalling of those resources was the responsibility of management and general foremen, who were a vital part of management, occupying a key position in ensuring that that maximum output was secured with minimum input. Productivity was the ratio between these two factors and it should be realised that it was possible to achieve concurrently a high rate of production and a low level of productivity.

The resources at the disposal of the building industry were considerable, but the need for the optimum use and effective planning, organisation and integration of such resources was an extremely complex matter, particularly in view of the fragmented nature of the industry and associated professions and the fact that most individuals engaged in building actively were individualists at heart.

A simple analysis of the general structure of the building industry provided an excellent opportunity for examining how the differing needs of building owners were identified and converted into productive action, for it showed that a clearly defined pattern of responsibility, authority and accountability was vital to the ordered conduct of building work. In a similar manner and on a smaller scale an analysis of the scope of work entrusted to a general foreman revealed a complex pattern of responsibility which required to be clearly understood.

PERSONAL COLUMN

MR. HAROLD WALKER, director in charge of the overseas business of the British Reinforced Concrete Engineering Co., Ltd., left on September 27 by BOAC for New York, Montreal and Vancouver. He will be visiting the company's wholly owned Canadian subsidiary, BRC Weldmesh, Ltd., in Vancouver, where production of welded mesh started in June.

MR. L. E. P. TYLOR, of Coward, Chance & Co., has accepted an invitation to join the board of Ruston-Bucyrus, Ltd., excavator manufacturers, Lincoln.

MR. EDGAR PRENTICE, general sales manager of the Expanded Metal Company, leaves on a business trip to Canada from London Airport on October 6.

MR. G. N. WRIGHT has been appointed an executive director of Tarmac, Ltd. He was previously commercial manager.

MR. JOHN NEWMAN, a director of the Rom River Co., Ltd., is in the USA investigating American methods of fabricating, distributing and fixing steel reinforcement for reinforced concrete construction.

EASTERN FEDERATION

Apprenticeship Awards, 1957

THE Eastern Federation of Building Trades Employers has now announced the winners of this year's apprenticeship awards. After interviewing several candidates, the new award of a place at the Ullswater Outward Bound Mountain School course from August 25 to September 20, 1958, has been made to G. E. BLAY, of Stanstead Abbotts, plumber apprentice with David Chaston, Ltd., Hoddesdon (technical college—Tottenham).

The winners of the five awards of £10 are:—

S. J. M. BARKER, Dovercourt, carpenter and joiner apprentice with A. Smith & Sons, Ltd., Harwich (Harwich Centre of Further Education).

W. G. BARTRAM, Kempston, carpenter and joiner apprentice with Samuel Foster, Ltd., Kempston (North Bedfordshire College of Further Education).

J. M. WEAVER, Dovercourt, carpenter and joiner apprentice with Edward Saunders & Son, Dovercourt (Harwich Centre of Further Education).

T. C. HOWARD, Norwich, plumber apprentice with W. J. & F. Taylor, Ltd., Norwich (Norwich City College and Art School).

C. D. HINDLE, Norwich, plumber apprentice with W. J. & F. Taylor, Ltd., Norwich (Norwich City College and Art School).

There was an improvement in the standard of previous years, and many more applications were submitted for awards on the new basis. Twenty candidates whose applications were considered of special merit will be invited to attend the Federation's weekend course for senior apprentices at Belstead House, Ipswich, from March 28 to 30 next.

OFFICIAL NOTIFICATION

War Damage Commission and Central Land Board

THE undermentioned Regional offices of the War Damage Commission and Central Land Board have been closed and their work has been transferred to London offices as shown:

Offices closed	*War damage* work transferred to:
Eastern Region	
Block D, Government Buildings, Brooklands - avenue, Cambridge. Area covered: Norfolk, Suffolk, Cambridgeshire, Huntingdonshire, Bedfordshire, Hertfordshire and Essex.	The War Damage Commission, City Gate House, Finsbury-square, London, EC2.
Southern Region	
Whiteknights, Earley, Reading. Area covered: Buckinghamshire, Oxfordshire, Berkshire, Dorsetshire, Hampshire, Isle of Wight.	The War Damage Commission, Government Building, Bromyard-avenue, Acton, London, W3. (Except work connected with *churches* which has been transferred to the Commission's office at City Gate House, Finsbury - square, London, EC2).

The *Central Land Board* work of the closed offices has been transferred to: The Central Land Board, 246, Stockwell-road, Brixton, London, SW9.

War Damage Technical centres will be maintained at: Norwich, Portsmouth and Southampton.

INCREASED USE OF CONCRETE TILES

MoW Report

THE extent to which concrete tiles and slates have displaced the once familiar red tiles made of clay, for roofing purposes, is shown in a report submitted to the South-Western Regional Board for Industry, by Mr. W. T. Lewis, Regional Director, Ministry of Works. The Board had asked the Director to undertake an investigation into the subject because of a request from the Bridgwater Roofing Tile Manufacturers' Association, who are perturbed at the continued fall in the use of clay tiles in the building industry.

MR. LEWIS said that in 1938 the average number of squares of clay tiles used in the United Kingdom was 126,000, whereas today it was only 41,000. On the other hand, the use of concrete tiles rose from 80,000 squares in 1938 to 164,100 during the past year. The use of slates had dropped during the corresponding period from 55,000 to 20,100.

It would thus be seen that the production of clay tiles and slates as compared with the year before the war has fallen considerably, while the production of concrete tiles has more than doubled.

Mr. Lewis stated that the choice of any particular roofing material usually rested with the building owner, his architect, and the contractor. Among the factors taken into consideration by them would be design, price and durability. Planning requirements would need to be satisfied, and in some parts of the country there might not be a free choice dependent upon local circumstances.

It was stated on behalf of the Manufacturers' Association that they were doing all they could to increase sales of clay tiles; it was accepted by them that they could not compete with concrete tiles in the original purchase price, but the Association claimed that clay tiles were more durable and had other attractions—weathering and appearance for instance—which it was thought should make their extended use desirable.

Another spokesman for the Association stated that he obviously did not expect the Ministry of Works or any other Government Department to pronounce upon the merits or otherwise of clay tiles as against concrete tiles, and he admitted it was for the manufacturers of clay tiles to demonstrate that their products were a better all-round proposition than any others. He appreciated that this was a matter entirely for the Association.

'Home Heating by Oil'

A permanent exhibition of oil-fired central-heating and hot-water systems has now been established at the headquarters of the Technical Sales Department of Esso Petroleum Co., at 87, Albert-embankment, London, SE11. The purpose of this exhibition is to give heating engineers, architects and builders a visual appreciation of the practical aspect of oil-fired domestic equipment and to promote a further knowledge of the subject by illustrating both pictorially and with equipment on display, the methods by which central heating may be employed in all forms of private dwelling houses.

LIGHT CLADDING—CONSIDERATION OF MATERIALS

Building Research Station Digest No. 99

The following Digest was prepared at the Building Research Station, Garston, Watford, Herts., and is reproduced with the permission of the Station, in whom the copyright is vested. BRS Digest No. 98, 'Light Cladding — General Principles of Design,' was reproduced in 'The Builder' of July 19.

Light Cladding Part I (continued)

THIS Digest concludes the discussion on functional aspects of light cladding, begun in the previous issue (Digest No. 98) and then considers materials.

Effective Joint Design

Many of the problems of light cladding construction as it has been practised so far concern jointing between the various parts. Ideally, such joints should:

(1) resist all working loads without undue distortion,

(2) permit components to be assembled easily with adequate tolerances,

(3) prevent rain and wind from entering the building,

(4) make sufficient allowance for thermal and moisture movements,

(5) preserve the insulating properties of the wall against heat loss and sound transmission,

(6) provide means for any maintenance that may be anticipated.

The very large number of possible joints group conveniently into :

(a) those relying on a seal made with a mastic or a gasket or both,

(b) those relying on mechanical stops, baffles or cavities for weather tightness,

(c) those combining the characteristics of (a) and (b).

The following are the chief features of these types :

(a) Plastic compounds or mastics based on mixtures of bitumen with drying oils and non-drying oils are available in many different forms ; examples of their uses are given in Digest 82. All of them, even when properly used, can be expected ultimately to harden and lose adhesion to adjacent surfaces.

For this reason their repair or renewal may have to be considered during the life of buildings. To prolong their life they should be shielded from sunlight and weather wherever possible and they should present as small an area as possible to the air. These qualifications suggest that mastic materials themselves need protection by an outer first line of defence, where they are used externally.

While a soft mastic joint can accommodate some periodic movement, it is unlikely to tolerate movement of more than 10 per cent of its superficial width over a period of years. A mastic intended to remain soft for long periods may be too soft to bear wind pressure satisfactorily and, in a wide joint, it may slump in hot weather. Where substantial movements in, or loads on, large panels are expected, it may be preferable to use a stiffer mastic in conjunction with a sliding joint.

As noted earlier, gaskets of synthetic or natural rubbers can be used to replace or complement mastics in butt joints and sliding joints. It is rarely possible to exclude water completely unless a gasket is under pressure ; thus, if the gasket is not designed as a compression fitting it may be necessary to rely also on a mastic or adhesive seal. The gasket should be protected as far as possible from weather.

In recent months, mastics have been introduced based on synthetic rubbers, which seem likely to prove durable.

Two-part thiokol jointing compounds have been used in the aircraft industry for about 20 years. The two parts are mixed in specified proportions immediately before use and have a ' pot ' life which varies with temperature, but usually of about eight

MATERIAL	DURABILITY			BEHAVIOUR DURING FIRE (See Note 2)	THERMAL CONDUCTIVITY (BTU in/sq ft/hr/°F diff.) See note 3	UNRESTRAINED MOVEMENT DUE TO	
	IN DRY CAVITY	IN WET CAVITY	EXPOSED TO WEATHER			TEMPERATURE CHANGES (inches in 10 feet for 160°F differences)	MOISTURE CHANGES (inches in 10 ft for dry-wet change)
ALUMINIUM AND ALLOYS (See also Digests 39 and 40)	Satisfactory	Will need paint protection at points when water can lodge. Details of paint treatment should be discussed with manufacturer.	Durability depends on the alloy used. May need paint protection and will certainly need regular cleaning in towns if a bright appearance is to be maintained.	Non-combustible	So high that for calculation purposes the inverse property, Resistivity (1/k) should be taken as zero and only the surface resistances should be considered.	About 0.26	None
CONCRETE (dense)	Satisfactory	Satisfactory provided reinforcement has adequate cover.	Adequate cover to steel reinforcement and good quality concrete are necessary. Smooth finishes may soil and craze; exposed aggregate finishes will generally weather uniformly.	Non-combustible	High. about 10.0 when dry.	About 0.12	About 0.04 (See Note 5)
STEEL	Requires protection (Grade 5 of BS.PA. 420)	Requires protection Grade 1 of BS.PD. 420	Requires protection (Grade 1 of BS.PD. 420 but see Note 1)	Non-combustible	See note above on aluminium.	About 0.12	None
NATURAL TIMBER	Satisfactory	Advisable to impregnate with preservative under pressure unless the wood is naturally resistant to rot. Dip or brush treatment with a recognised wood preservative may suffice in situations where there is no risk of persistent dampness.	Rot-resistant woods like Western red cedar need not be painted or otherwise preserved. They will weather to a grey colour but they will probablybecomedirty in town atmospheres. Varnishes will usually be less effective than gloss paints in preserving appearance. Frequent oiling will give a good appearance initially but oiled surfaces rapidly soil.	Combustible	Low. About 1.0 when dry.	When dry: With grain 0.03-0.09 Across grain 0.37-0.71 (but see Note 4)	Variable according to species but see Note 5.

Table 4.—Framing Materials

hours. The mastics are most conveniently applied by special guns, but can be applied or smoothed off with a knife dipped in white spirit. In a day or so, they change to a material rather like soft rubber. The cost is, however, much higher than that of putty and replacement of panels set in this material more difficult. Excellent adhesion is developed to most surfaces, provided they are clean and free from grease.

Tape mastics based on other compounds such as polyisobutylene are also available, but less is known of the retention of adhesion to various surfaces over a period of years.

(b) Mechanical joints in which the shapes of the joined members are devised so as to exclude wind and water while meeting other functional requirements are probably most familiar in the patent glazing field. Here, horizontal joints often depend upon a weathered projection or drip which may have to allow for the possibility of wind-driven water being forced upwards. The outer capping to vertical joints of this type is used as primary weather protection but the secondary drainage channels usually intended to carry away condensation may be equally useful in severe exposures to cope with wind-driven rain. Such joints as these have to be effective without relying on very fine assembly tolerances and many are attractive to the user because they remain efficient without needing any replacement of impermanent seals.

(c) Joints which combine a mechanical outer barrier with an internal air-tight seal combine a large proportion of the ideal characteristics noted earlier. If at the same time they provide access for maintenance, they can bring together the separate advantages of the other two types.

Improvement in joint design is to be expected but it seems unwise at the present stage to assume that joints will be completely weather tight under all conditions, and for this reason it is suggested that preference be given to drained cavities as a method of water disposal, at any rate in the British Isles. Experience in very much colder winter climates suggests that there are objections to the methods of jointing using drained channels on the grounds that water penetrating from the outside or forming as condensation from within can freeze and block the channels and outlets.

Durability and Maintenance

Traditional durability was thought of in terms of hundreds of years but it has become the practice to accept materials whose useful life is measured in tens of years only. The materials referred to in Tables 4 to 6 (of Part 2) include some which fall into this latter category and account should be taken of this when the durability of specific materials is considered.

The materials likely to be used in various forms of light cladding construction are reviewed in the following tables and supplementary notes. Among the large variety available, some are familiar materials used in new ways and others have very recently been introduced. Despite long experience with the former materials, the changed use presents some unfamiliar problems for which adequate solutions have not yet been found; with newer materials the difficulties are often enhanced. A reliable assessment of the durability and weathering properties of many new materials may not be possible for many years since deductions from artificial weathering tests cannot be relied on. Thus the qualitative judgments given later may be modified by experience and by further developments in manufacturing technique. They will be kept under review and amended or amplified as necessary.

At present the requirements of British Standards, so far as they relate to established practice, can be accepted as criteria of quality for building materials. Where guidance is lacking, a basis of judgment on past example and experience must be adopted. In drawing conclusions from these, users should take care to avoid confusion between materials with the same generic name. That 'steel' or 'aluminium' describe a variety of alloys with very different specific properties needs no emphasis but 'plastics' is a term easier to misinterpret, for the materials named after a common resin component may in fact differ widely according to differences in the proportions or types of filler, plasticiser or pigment they contain and the degree and type of polymerisation.

In terms of maintenance and weathering properties, the materials can be grouped broadly as follows:

(1) Those that need regular maintenance to preserve their life or their efficiency.

MATERIAL	DURABILITY AND WEATHERING BEHAVIOUR	WEIGHT lb/sq ft	BEHAVIOUR IN FIRE (See Note 2)	MOVEMENT DUE TO Temperature Changes (in per 10 ft per 160°F diff.)	MOVEMENT DUE TO Moisture Changes (inches in ten feet for dry-wet Change) (See Note 5)
CONCRETE (dense)	May soil or craze if finished with a smooth surface. Exposed aggregates mask crazing and generally weather uniformly. Care in detailing projecting features can reduce the streakiness which results from uneven washing by rain. Adequate cover to reinforcement essential.	About 25 in 2 inch thick slabs	Non-combustible	About 0.12	About 0.04
FIRED CLAY TILES	The best qualities have excellent weathering properties. Frost resistance is the prime requirement of glazed tiles subject to outdoor exposure. The manufacturer should be consulted about frost resistance and the resistance to crazing of the glaze used. Vitreous tiles lack the suction necessary for good adhesion on vertical surfaces and they therefore need a pronounced mechanical key.	5—15 according to thickness	Non-combustible	About 0.06	Relatively very small except when products are fresh from the kiln.
SLATE (butt jointed)	Excellent weathering properties if slate conforms to test requirements of BS 680 (See Note 6 and Digest 45)	About 15 is 1 inch thickness	Non-combustible	About 0.11	Negligible
GRANITE	Excellent natural weathering properties. Polished surfaces need periodic washing in dirty atmospheres. Rough surfaces will pick up dirt which is likely to be difficult to remove. (See Digests 20 and 21)	About 28 in 2 inch thickness	Non-combustible	About 0.11	None
SANDSTONE	Excellent natural weathering properties when laid on its natural bed but most varieties easily pick up dirt which is often difficult to remove. Care should be taken, and the quarry owner's advice sought, in selecting a stone for slabbing with the natural bed vertical. (See Digests 20 and 21)	About 24 in 2 inch thickness	Non-combustible	About 0.12	About 0.08
MARBLE & DENSE LIMESTONE	Excellent natural weathering properties but surface polish may be lost quickly in town atmospheres and appearance may become patchy unless care is taken in the design of water-shedding details. (See Digests 20 and 21)	About 7 in ¾ inch thickness	Non-combustible	About 0.04	Negligible
POROUS LIMESTONE	Excellent natural weathering properties but superficial erosion of rain-washed areas will occur, especially in town atmospheres. In towns, dirt will accumulate under projecting features but cleaning is not difficult. (See Digests 20 and 21)	About 23 in 2 inch thickness	Non-combustible	About 0.03	About 0.01

Table 5.—Facing Materials

Within this category are softwoods, ferrous metals and painted or stove-enamelled surfaces.

(2) Those requiring periodic cleaning so that their natural appearance can be retained. They include glass, vitreous enamel and non-ferrous metals such as aluminium (on which guidance is given in Digests 39 and 40). Although rain may wash away some dirt, these materials are not self-cleaning.

(3) Those which weather naturally and need only occasional cleaning. Natural stone, certain concrete or clay products and metals such as copper are included in this group.

In the second and third groups a rough texture or surface pattern can help to obscure irregular staining by dust and rain but cleaning may be difficult. Maintenance requires accessibility both of components that may need to be cleaned, repaired or replaced during the life of a building or of jointing materials. Build-

MATERIAL	DURABILITY AND WEATHERING BEHAVIOUR	WEIGHT lb/sq ft	BEHAVIOUR IN FIRE (See Note 2)	MOVEMENTS DUE TO THERMAL CHANGES (inches/10 ft/160° F difference)	MOVEMENTS DUE TO MOISTURE CHANGES (inches in ten feet for wet-dry change)
ASBESTOS CEMENT	Generally satisfactory. The fully compressed types have the better durability and resistance to weather. All unpainted products will ultimately lose their surface finish by losing cement at the exposed surface and by carbonation. Fully-compressed sheets may lose only their initial gloss but the surfaces of semi-compressed types may ultimately be raised.	About 2 in 3/16 inch thickness	Non-combustible	About 0.09	New, about 0.15 Old, about 0.06
GLASS	Excellent natural weathering properties. Adequate clearances for thermal movement are essential. See Note 7.		Non-combustible	In windows 0.06 Opaque or backed by insulation 0.12	None
ALUMINIUM	Some alloys commonly used externally have adequate durability themselves; others need paint protection. Unprotected sheets will need regular cleaning in towns and coastal districts to keep them looking fresh but whatever maintenance is given, it must be expected that the metal will eventually weather to a matt, grey white surface which will pick up dirt in towns. See Digests 39 and 40.	About 0.9 in 1/16 inch thickness	Non-combustible	About 0.26	None
STEEL	Unless of a 'stainless' composition, will require protection and durability will depend on the adequacy of the initial protective treatment and on subsequent maintenance. (See Note 1)	About 2.5 in 1/16 inch thickness	Non-combustible	About 0.12	None
VITREOUS ENAMELLED STEEL	Correctly formulated glazed coatings are reasonably durable except when mechanically damaged.	About 2.5 in 1/16 inch thickness	Non-combustible	About 0.12	None
PLASTICS Paper-filled phenol-formaldehyde laminates	Can be expected to remain structurally sound under normal weathering conditions for upwards of 20 years. The natural surface gloss will be lost fairly quickly and the surface may develop a patchy appearance. The core types of material may also show the pattern of the core on the face in time.	Vary, but all relatively light.	Combustible. Variable spread of flame.	High. About 0.39	Negligible
PLASTICS Laminate as above but with decorative melamine formaldehyde face.	Experience is limited but there are indications that at least some of the pigments used at present may fade appreciably in a few years, even though the surface gloss will endure.	As above.	Combustible. Variable spread of flame.	High. About 0.39	Negligible
PLASTICS Transparent acrylic polymers—e.g. 'Perspex' 'Plexiglass'.	Reasonable durability provided the materials are properly annealed and not exposed to abrasion.	About 0.8 for flat sheet ⅛ inch thick	Combustible	About 0.5 (in flat sheet or along corrugations)	Negligible
PLASTICS Glass fibre polyester resin laminates	Experience is limited but judging from American reports, structural durability is reasonable but it varies with composition. Sheets may darken when they are exposed to sunlight.	About 1.7 in ⅛ inch thickness	Combustible. Variable spread of flame	Translucent 0.14 Coloured or opaque 0.21 (in flat sheet or along corrugations)	Negligible
NATURAL TIMBER	Rot resistant woods such as Western red cedar need not be painted or otherwise preserved on vertical surfaces. They will weather naturally to a grey colour and probably become dirty in town atmospheres. Varnishes are generally less lasting than gloss paint with appropriate undercoats in preserving a clean appearance on durable wood or ensuring durability of woods which need protection. Secret nailing or lost head nailing will avoid local staining as a result of corrosion in unpainted wood cladding; if either of these is impractical, copper or galvanised steel nails may be used. Timber weatherboarding, vertically fixed, is most vulnerable to rot in the end grain of its lower edges. Wherever possible, water should be allowed to drain freely from these edges. If they enclosed in grooves or covered by beads, local treatment by dipping in or brushing with colourless preservatives is advisable.	About 2.0 in ⅞ inch thickness	Combustible. Spread of flame Class III or IV untreated.	Unlikely to be significant	Varies with species (See Note 5)
RESIN-BONDED PLYWOOD	For external exposure, the W.B.P. grade specified in B.S.1455 (1956) should be used. If the edges, especially the bottom edges, of plywood sheets are to be enclosed in grooves, or covered by beads, local treatment with colourless preservative—preferably by dipping—is advisable. Alternatively, plywood of which every veneer has been impregnated with preservative before manufacture may be used. On exposure, untreated face veneers will change quickly from their natural colour to a uniform blue-grey but the natural colour of the face can be preserved for at least five years if the veneer is impregnated with phenolic resin during manufacture. This treatment considerably limits surface checking—a useful property if ever surface painting is contemplated. (See also Note 9)	About 1.75 in ½ inch thickness	Combustible. Spread of flame Class III or IV untreated	Unlikely to be significant	(See Note 9)

Table 6.—Cladding Materials

ings that extend above the safe reach of ladders are unlikely to have all their maintenance needs served by openable or reversible windows; the sensible practice is to provide permanent gantries or walkways from which cleaning and other maintenance can be done safely and conveniently.

Part II : Materials in Detail

Framing Materials

Appropriate properties of exposed framework to which cladding is attached or into which it fits are shown in Table 4. The information in the table is amplified by the following notes:

Note 1. Exposed (and therefore accessible) steel may be protected by less efficient treatments than those classed as Grade 1 in BS PD 420, but such treatments will require more frequent attention and ultimate maintenance costs may be greater than they would be if the highest standard of protection were provided initially.

Note 2. Combustibility and fire resistance are the important design considerations relating to fire hazard but fire resistance is a property which relates to the wall as a whole. It is not possible therefore to quote specific periods of fire resistance for materials alone.

Note 3. In metal frames, high thermal conductivity must be reckoned with if local heat loss and cold spots that might encourage condensation and pattern staining are to be avoided.

Note 4. Thermal movement is particularly important in the layout of jointing positions for metal mullions and in the provision of movement joints between metal members. The order of movement in timber is much less along the grain than across it, but movement may be significant where splices are glued in mullions which extend many storeys in height. Structural concrete mullions which are continuous through many storeys may deform slightly between the points of restraint but the change in temperature that would affect metal members in similar positions is unlikely to range so widely in exposed concrete because of its general lightness in colour and its greater thermal capacity.

The figures shown in the table apply to framework which is exposed to sun and are based on an extreme temperature range of 160 deg. F. In sunless orientations, or when the frame is covered, thermal movements will be much less.

Facing Materials

The heavy panels of brickwork or blockwork often used for infilling between structural frames are not dealt with here but heavy materials may be used as applied facings for structural members and their general properties are therefore listed in Table 5.

The materials mentioned in Table 6 are those which may all be used for light cladding panels.

Note 5. Movements caused by temperature and moisture changes in exposed materials such as wood and cement products may often—perhaps usually—act in opposition. For example, materials exposed to the sun will tend to dry as they are warmed and extreme contraction due to low temperatures can be expected to occur when the material holds a good deal of moisture. Where this fortuitous balance holds good it offers an additional measure of safety against trouble caused by extreme fluctuations of size, but its existence should not lead designers to underestimate the importance of allowing for expansion. Nonporous materials have no drying contraction to compensate for thermal movement and omission to make full allowance for the expansion say of long runs of butt-jointed material has led to costly failures.

The units of moisture movement in Tables 4 and 6 are not entirely appropriate to natural timber since only the cross-grain movements are significant and these will affect only individual widths up to 1 ft. The extent of cumulative expansion across the grain in built-up panels will depend on the tightness of joints. In average conditions of exposure, timber can be expected to vary in moisture content between 22 and 15 per cent of dry weight between winter and summer—though in very hot, dry weather, thin boarding or shingles may reach moisture contents of less than 10 per cent. In internal surroundings protected from external dampness, the moisture contents may vary in the opposite way: from 8 per cent in midwinter in a well heated building to 15 per cent in late autumn before the heating season starts. The corresponding ranges of movement differ with species and with the disposition of the grain but the following average values in inches per foot can be assumed for design purposes:

(*a*) for external exposure 0.2.

(*b*) for protected conditions internally 0.16.

Softwood boarding firmly fixed to battens will accommodate some and possibly all the moisture expansion it suffers by compression and the only effect of such distortion may be that subsequent shrinkage is more pronounced. Denser hardwood boards, having an internal structure more resistant to compression, will be more inclined to spring their fixing nails or distort their battens if they are fixed together tightly while they are relatively dry.

Note 6. The weathering qualities of natural stone to be selected for a particular district can usually be assessed from its behaviour in buildings in a similar environment though care should be taken to distinguish between the methods of fixing and the direction of the natural bed when stones are directly compared.

Slate cannot always be judged on past behaviour in roofs where rain washing is likely to be more uniform than it is in walls. Where the slate to be used will meet the test requirements of B.S. 680 there need be no concern about ultimate durability but where specimens containing much calcite are considered (viz. Westmorland slate, of which the relationship to BS 680 is discussed in Digest 45), the designer should attempt to ensure uniform rain washing of the exposed surfaces or satisfy himself by inspection that other similarly clad buildings do not show streaky weathering.

Note 7. Many disappointments suffered over the cracking of exposed glass for cladding can be put down to an underestimation of the movements and stresses caused by temperature change and direct sunlight. So far as is known at present, the risks of cracking can be reduced if attention is paid to the following:

(*a*) Care should be taken that projecting points and flaws at the edges of glass sheets are not introduced during cutting, transport or handling on site. The use of suction pads can facilitate handling and reduce the risk of local damage when the glass is set in position.

(*b*) The glass should be supported preferably on lead or hardwood spacers at frequent intervals along its bottom edges. Some thermoplastic spacers may flow under load.

(*c*) Clearance between the glass and its frame must be adequate to allow for relative thermal movement. Normal glazing tolerances are adequate for clear glass in windows but, round coloured glass or clear glass backed by coloured insulation, clearance of $\frac{1}{4}$ in. in 4 ft. is advisable.

(*d*) The stresses due to temperature differences between the edges and the centre of sheet glass become less as the width of the covering beads is diminished. Some manufacturers now advise that, where coloured glass is to be used, not more than $\frac{3}{8}$ in. should be covered at the edges.

(*e*) It is impossible during manufacture to avoid flaws at the edges of wired glass and this should not therefore be used in coloured form.

Note 8. The values of thermal movement given in Table 6 are again based on an extreme temperature change of 160 deg. F. In thin sheets, transparent and translucent materials are unlikely to attain this extreme range. It has therefore been assumed that glass, transparent acrylic polymers and nearly transparent glass/polyester laminates will change by 80 deg. F. and that translucent or coloured polymers of this type change by 120 deg. The expected movements quoted for these materials are accordingly one half and three quarters the movement expected for an extreme range of 160 deg. F.

Note 9. B.S.1455 (1956) 'British Made Plywoods' is linked to B.S.1203 (1954) 'Synthetic Resin Adhesives' to cover the manufactured product and the quality of the glue. The highest resistance to delamination is possessed by the W.B.P. plywood grade of B.S.1455, of which there has been experience in severe exposure for about 15 years in this country. The durable glues used to bond the plies and sometimes to impregnate the face veneer do not confer any special resistance to the usual kinds of timber decay; thus, where exposure conditions warrant it, preservative treatment should be considered.

In exposed, unpainted plywood, checking of the face veneer must be expected during the first few months of exposure. It extends only to the first glue line however and it does not signify any deterioration of the wood—though appearance on close inspection will be affected and the material may be rather difficult to deal with should

paint treatment be subsequently considered.

The natural colour of the wood can be most effectively preserved if the face veneer is resin-impregnated during manufacture. Facing the veneer with an almost transparent resin-impregnated paper is at present a treatment with very limited durability in outdoor exposure. Opaque faces of phenolic resin-impregnated paper appear to have a better outdoor performance and they provide suitable surfaces for painting.

In outdoor exposures, unrestrained moisture movements, which occur across and parallel with the face veneer, will average about 0.38 in. in 10 ft. Used internally between a range of relative humidities from 30 to 90 per cent, plywood is likely to have an unrestrained movement of about 0.26 in. in 10 ft.

Insulating Materials and Vapour Barriers

It is not possible to deal comprehensively here with the very many materials at present available. Reference may, however, be made to 'The Thermal Insulation of Buildings,' by G. D. Nash, J. Comrie and H. F. Broughton (H.M. Stationery Office) for information about materials in current use. Attention in these notes is confined to new materials which are appearing, or which may soon appear, on the British market.

Foamed polystyrene in sheet or slab form in densities of 1.5 lb./cu. ft. upwards has been used successfully in America for the last nine years. At the lowest density its thermal conductivity is about 0.25 and this type of material will remain unsupported without slumping. The high strength-weight ratio allows material of somewhat greater density to be used as a core bonded to rigid facings of plywood, metal or plastic sheet and as such it can combine the properties of insulation and vapour barrier treatment. Foamed polystyrene is combustible.

Vapour barriers may be introduced as part of the insulation treatment, as with foamed polystyrene and aluminium foil, or they may be applied in sheet forms which allow impermeable joints to be made by bonding adjacent sheets. Self-finished bitumen felts of the kinds specified in B.S. 743 and 747 may be so used. Polythene film is now available and it is likely that thermoplastic polyester film will be developed for this purpose. The latter is claimed to have the lower permeability to vapour per unit thickness and it is accepted in America as a vapour barrier in thicknesses from 4 to 6 thousandths of an inch. Neither material has high resistance to puncture or rough usage.

The Sewage Hazard

A resolution asking the Government to initiate research to find the extent of public health hazards associated with discharge of sewage and sewage effluent into water courses and the sea, and an efficient method of sterilising sewage effluent, was passed by the conference of the Association of Public Health Inspectors at Eastbourne on September 19.

Regional Building Conference, Portsmouth

'PLANNING OF CONTRACTS & SITE ORGANISATION'

THE Eighth Regional Building Conference for teachers of building, architecture and related subjects and for members of the building industry and associated occupations was held recently at the City of Portsmouth College of Technology.

Organised by the Southern Regional Council for Further Education and Portsmouth Education Committee, the conference was attended by 110 representatives under the chairmanship of Mr. E. G. Llewellen, FIOB. The conference was welcomed by the Lord Mayor of Portsmouth and Southsea, Councillor A. G. Asquith-Leeson, TD, JP. Two papers were presented—MR. E. U. BROADBENT, BSc(Eng)., of Messrs. John Laing and Son, Ltd., spoke on 'The Planning and Control of Contracts' and Mr. Stanley Reynolds, of Messrs. Holland & Hannen and Cubitts, Ltd., on 'Site Organisation and Administration.'

Contracts

In his speech, MR. BROADBENT said:—Control involves two operations, first direction, and second verification. Direction involves decisions on what has to be done. Verification means checking on what has been done. The extent to which a manager keeps check on what he had in mind and what is actually being done is a measure of his control.

Direction involves a number of steps by the manager. He must establish an aim, and then decide how it is to be achieved. He will need to break the job down into smaller jobs, each of which should be considered in stages so that eventually there is a reasonably clear picture of what every man and every machine is going to do. The sum of these efforts should result in the complete job. Planning is part of the wider field of control, and establishes the aim.

Control reaches its highest level when information is available on the completed job from start to finish, so that the next job can be planned even more effectively on the basis of experience gained on the first. Verification plays its part in each small stage of operation; only in this way can it be used effectively as a contribution towards the final achievement.

Preliminary Planning and Check Controls.—It is necessary to examine how things fit into sequence and to decide on the types of people and the types of machines required. The time to be allotted, the standard of performance, and the quality of work should all be determined in the planning stage. Provision should be made for trouble which might arise owing to lack of site information, or changes of mind by the client. In short, the plan cannot be rigidly followed, and there must be flexibility to meet unexpected situations. This puts a practical limit to the detail with which plans can be prepared. A compromise is necessary, and a type of planning involving two stages will meet the situation, namely a long-term plan and a short-term plan of the following types. There are probably other ways of meeting the situation, but let us consider this one in more detail:

1. There must be a general long-term plan, setting out the major sections of work, their sequence, duration and extent; including excavations, concrete foundations, steel frames, floors and finishings. The time available for these various stages should be determined, and this means that the methods to be used should be decided, including machines and men, numbers and types.

2. When the preliminary plan is out then short-term plans must be made in more detail, breaking down the major sections of work and operations, covering every man and machine on the site.

3. After the more detailed plan has been drawn up it should be sent to the man on the job, either the agent or the general foreman, and the programme might then appear in the following form. Preparation of the general programme:—(a) Method. (b) Timing, sequence, phasing. (c) Men, materials, machines, sub-contractors. Planning the team jobs:—(d) Draft master programme, setting total time. (e) Study main phases or sections and allot approximate times and sequence. (f) Decide on methods. (g) Recast the draft into a job master programme. (h) Break down main sections to show more detailed timing and sequence of operations and trades. (i) Check with suppliers, specialists and subcontractors to ensure practicability and adjust as necessary for known delays and difficulties.

It is a good principle, even if a specialist planner is being used, to consult with the man on the job. The specialist and the foreman should agree on how the job is to be done. Consultation with appropriate management levels at all stages is strongly to be recommended.

The Agent's Job

Once the programme is produced the agent must either work to it, or make alterations only after full consideration and with full appreciation of their total effect. His job is to build up and maintain the right strength and balance in his labour and plant forces. He will find it most helpful to make short-term plans (possibly weekly) allotting available resources of men, machines and materials to defined jobs each week. He will also find it valuable to carry out regular and systematic progressing of information on materials and sub-contractors' work.

Planning is incomplete unless in addition to establishing sequence and the total time of sub-operations it also sets standards of performance. Control is ineffective unless there are standards against which to measure work. Things will rarely go exactly to plan, but it should be easy to check if work is dropping behind the planned time-table. Of the three definite stages in planning: (i) in the office, (ii) in more detail, and (iii) the job stage, the last is the really important one. Control must be effective at the job stage; it must lead to action, it

must be in time, and it must include production and non-production operations.

If control figures cannot be used properly then there is no point in having them at all. There are five major aspects of control: General financial or budgetary control, progress control, cost control of labour and machines, materials costing, quality control.

Progress control will be exercised effectively by the use of charts which will be made up from day to day. Any deviation should be reported, and action should be taken to get back to the timetable laid down.

On the labour and machine costs checks should be made often enough and soon enough to secure effective action. Productive items will normally be included, but if incentive payments are made on productive work it becomes even more important to check the non-productive operations. Excessive cost of labour or machines should be analysed, to ascertain where the loss is taking place, and action should follow quickly. On materials a careful check should be kept of excess wastage, keeping clear information on what is bought and what is actually used.

Mr. Broadbent summed up by saying that control eventually is concerned with individuals doing particular jobs. To control the total result we must direct and influence each individual, and to do this effectively we must know beforehand what can be expected of each individual. If we are successful in getting each person to do the right job at the right tempo and in the right way, the total result will be a success.

This should also be explained to those we promote out of the ranks of craftsmen to be chargehands or foremen, and they should have clearly explained to them what the men on the job are required to produce and the way in which they are required to produce it. Such men should be of suitable calibre, able to exercise positive control to secure that the jobs are done in the right way, so contributing to the success of the total job.

Discussion

MR. C. H. CLARK, president of the Portsmouth Builders' Association, opened the discussion and referred to the opportunities available for education and training, which were now leading to the appointment of better qualified chargehands, foremen and general staff. Control and planning could be more effectively carried out by securing full co-operation of supervisory grades.

The following points were made in the subsequent discussion: Cost control as suggested by Mr. Broadbent was difficult for the medium-sized and smaller building firms. The smaller firm is conscious of the need, but it is not always easy to ascertain at what stage it becomes profitable to use the techniques.

MR. BROADBENT believed that even the smallest firm could make use of the techniques with advantage. Although in a large organisation a large number of people are employed on cost control, the smaller firms could and should make use of the personnel they had available. The process was not too difficult nor too technical and was very good training for young people. It did not take the personal quality out of the job, and it should not adversely affect the personal approach to the individual on the job. Things were not made mechanical simply by imposing control, and regard should be had to 'man management' in addition to the subject of the talk, which was concerned only with contracts. The right kind of manager or foreman would be very helpful in bringing others along in the right direction.

It was difficult and not very useful to base estimates on labourers' time sheets. The standard of allocation of work should be raised and this could be done by having someone on the site who could help the men to fill in their time sheets adequately. It became difficult when the site was to be moved and new labour employed, but it was worth while.

Control was a way of getting efficiency up and costs down. The industry was becoming more competitive and this was one way of meeting the situation.

How much of the cost planning would be passed back as saving to the client? Would it merely increase the builder's profit? Unless there was a plan an estimate could not be properly prepared, and it was more likely that cost planning reduced the cost to the client.

Reducing Waste

In order to reduce waste of materials on a building site could the operative be given more knowledge of the work he was engaged upon? Mr. Broadbent agreed that it was helpful from all points of view to keep operatives aware of the way in which their job fitted into the entire structure.

When should the planning begin? If we were to plan in the way suggested (before estimates were prepared) more time would elapse before estimates could be submitted, and definite plans must be prepared on how the operation should be carried out. Mr. Broadbent agreed and suggested again that without a plan estimates could not be made. If it was decided to plan properly the man responsible should see to the planning of every part of the job. He should, of course, draw on the planning experience of those actually doing the job rather than leave the matter entirely to the estimator. If people outside a firm did the estimates then they should prepare the whole thing from start to finish.

What was the relationship between standard times and the effect on the planning of contracts? Mr. Broadbent said that his firm had been establishing standard times for all types of operations. They were not infallible, but they were very useful. They could be agreed as a fair work figure for a particular job, and on the basis of standard times, planning on smaller jobs could be made reasonably effective, giving the builder information on just how many men and machines were required.

In his speech, MR. REYNOLDS said:—The manager of a project (whatever title he may have) can only function effectively through the combined efforts of architect, consultant, quantity surveyor, contractor, the trade unions, and his own efforts as the man in charge of the job. Since pre-war days, when conditions were very different, the building industry has encountered special problems resulting from the introduction of new materials and techniques. In addition the sub-contractor is more fully aware of his position in the industry.

The following matters affect site organisation and administration:—1. Information available at the tendering stage. 2. Information, including specifications, at the acceptance stage. 3. Availability of labour. 4. Plant and equipment. 5. Nominated sub-contractors. 6. Availability of materials, particularly for the early stages of the contract. 7. Variations. 8. Difficulties which arise in the course of the work, due to new materials or untried designs. 9. Safety and welfare. 10. Satisfactory opportunities and pay for the men on the job.

Site Organisation

Mr. Reynolds elaborated on each of these points, relating the efforts of all those concerned with the job, from the architect to a craftsman. In pre-war days labour and equipment were more freely available and management was comparatively simple. Today the problem of management is much more difficult, and the wole process of building work must be carefully prepared during a considerable period before the work actually begins. This makes it necessary to bring about as soon as possible a meeting of all the interested parties so that they can work as a team. It can never be too early in the designing stage to bring in the contractor.

Site administration depended upon the architect, the consulting engineers, the contractor, the project manager, the agent or general foreman, the trade union organisation, sub-contractors, employees, and the head office side of the contractors' organisation. Mr. Reynolds explained the effect of the contributions of each of these to the site administration, concentrating on the function of the project manager.

The architect has full responsibility for the preparation of the contract and the drawings. When work begins on the site the architect should have completed his drawings and be able to watch that the contractor carries out the work in accordance with the contract and to the architect's satisfaction. Mr. Reynolds referred to American building practice and the vital contribution to productivity which could be made by the architect. Delays on the part of the architect in the supply of information before the job starts, or in giving decisions on matters as they arise, are reflected all the way through the job.

Consulting engineers work with the architect by advising on or accepting responsibility for the design of various parts of the job, for example, structure and foundations, services, etc. It is just as important for the consulting engineer to have his drawings completed in good time as it is for the architect.

Contractors have much work to do

leading up to the appointment of the man to be placed in charge of the site. The manager selects the project manager, agent or general foreman, depending upon the size of the project, and briefs him on relevant points of the contract. The project manager then prepares programmes of work in the form of charts, he plans the phasing of labour, and prepares layouts for work on the site. He makes the necessary arrangements for the advanced ordering of materials, stacking areas and so on, working closely with his colleagues at Head Office. He then discusses with his supervisor the proposed plan of work, and when agreement has been reached possession is taken of the site and the work begins.

The project manager is responsible for the whole of the labour on the site and should keep constantly in mind the need for good welfare and site conditions, together with information on the project by the use of talks, drawings, models and photographs showing the progress made. The separate responsibilities of everyone working on the site should be clearly defined. At the same time the arrangements should be sufficiently flexible to meet variations which occur for one reason or another. The project manager should maintain direct control of site meetings, e.g., meetings of sub-contractors, and joint production meetings.

Referring to trade union organisations, Mr. Reynolds said it was not enough simply to accept the principles of unionism and to know the rule book. Human problems call for good approach, good handling and a large measure of understanding, in addition to useful experience. Relations between the contractor and the trade unions show considerable improvement compared with earlier days, and the unions appreciate that the future of the industry and maintenance of full employment in it largely depend on producing buildings more effectively, and if possible more cheaply. As a result many new methods and techniques have been accepted, for example work study.

The fullest co-operation should be extended to all trade union representatives, and the person in charge of the building site should make it his personal responsibility to see that the right conditions exist. This will provide a sound foundation for discussion, understanding and a reasonable approach to the problems which must arise from day to day in any job.

Sub-contractors' Position

Mr. Reynolds considered the position of sub-contractors also to be most important. They should be given full consideration in both overall and detailed planning when preparing the programme of work. All sub-contractors should be kept informed of the intentions of the project manager regarding the sequence and duration of the work for which they are responsible.

In view of the cost of labour it is of the utmost importance that the best use be made of each man's ability. The introduction of new materials and techniques should prove helpful, but in many cases their use does not call for craftsmanship of the traditional type. This may be a contributory cause of the shortage of craftsmen throughout the industry.

Provided a man has been given a reasonable opportunity he should produce a good standard of work at a reasonable cost, and this makes it necessary to consider selection more carefully. If more consideration were given to the need to fit the job to the employee the turnover of labour would be greatly reduced, and this would result in better control of overall costs.

The spirit of the man on the job is of great value and his interest and enthusiasm should be cultivated by giving him full information on the work and its progress.

Mr. Reynolds digressed on the question of training when looking to the future. Site organisation and administration might be described as the working part of the machinery of the industry, and it might be said to depend upon lubrication in the form of training. He then raised the point of whether training through the professional channels is necessarily the best training. Training should have regard to the requirements of the future both in terms of knowledge and methods, regarding building as an industry rather than an agglomeration of separate firms. He believed that in the ranks there were many potential managers provided the opportunities and the incentives were made available to them.

Mr. Reynolds summed up his talk by suggesting that the spirit of co-operation and team work is essential, and that information throughout the project is also essential.

Discussion

MR. A. WILLIAMS, honorary secretary of the Southern Counties Council of Builders, Foremen and Clerks of Works, opened the discussion by suggesting that the art of selection of men had been lost partly because there were very few applicants from whom selection could be made. He also referred to the need for care to avoid using new methods and machines merely for the sake of novelty. He agreed that it was important to try out new methods and machines, but the reasons for introducing them should be sound.

MR. C. H. CLARK outlined the method of arranging contracts. The planner or architect produced a plan, and presented it to the contractor before the job could begin. The contractor usually complained in this country that the architect was not very good at giving details, and after the job had been in progress for some months delays began to occur for want of adequate detail in the preliminary work. One of the major problems of the contractor was to decide at what point it was necessary to secure from the architect adequate information. He also referred to the nominated sub-contractor, saying that sometimes he was selected for reasons other than his ability as a sub-contractor.

MR. LOVELL said that after the contract had been secured it was necessary to have adequate time allowed before work commenced. He asked if Mr. Reynolds could give some indication of a reasonable time between acceptance of a contract and the start of the work for two types of job (a) a £10,000 job and (b) a £250,000 job.

MR. LLOYD, an architect of the City of Portsmouth, suggested that there were probably good and bad architects as there were good and bad contractors, and probably part of the blame in a number of cases must rest with the client. His experience was that most architects tried to get the drawings to the contractor in good time, but the difficulty was to get the information to put on the drawings, and it was this that caused the delay. He asked what was considered to be adequate information at the tendering stage.

Safety at Work

MR. HIGGS, National Federation of Building Trades Employees, referred to the question of safety and suggested that more attention may be given to it in present day industry. Men who are 'safety conscious' should be encouraged, and when suggestions on safety were made by the men, employers should have regard to them. He also referred to the attitude of site managers on the occasions of visits of trade union officials to sites. Some were very good, but others were not. The union officials did not expect the manager on the site to do the official's job, but it made things easier and co-operation was much more fruitful when relationships were good.

MR. BOSTELL, of Brighton, asked if there had been any cases when men working on a bonus scheme had had the bonus lowered on a subsequent occasion by employers.

MR. CAVE, Oxford School of Architecture and Building, College of Technology, Art and Commerce, referred to open tendering and selective tendering, saying that it was difficult under these circumstances to secure very much co-operation at a most vital stage. On the other hand people generally did not like the nominated job.

MR. REYNOLDS replied to the discussion as follows: *Selection.*—Mr. Williams had probably been thinking of the men on the job as craftsmen, but there were not very many craftsmen today. The general foreman's real task was to select the men for the jobs as they at present exist.

Contracts.—In reply to Mr. Clark, he suggested that the architect should be told of the urgent need for drawings so that materials could be ordered. It was of no value or help if architects held on to drawings for a long time, sometimes for up to a year or two on really big jobs, and then passed them over to the contractor, giving him inadequate time in which to secure materials and labour.

On the question of sub-contractors he suggested that some appeared to be privileged, having direct contact with the architect, and thereby making it much more difficult for the main contractor. It should not be necessary for any contractor to have to accept a nominated sub-contractor.

Planning Time.—Mr. Reynolds thought that the small job could be planned in three to four weeks, but larger jobs might

take two to three months. If more time than this could be allowed it would not be wasted, it would be most useful.

Safety.—Mr. Reynolds agreed with Mr. Higgs, but suggested that contractors in general did try to provide safety conditions. He had found a marked improvement in the way men understood and accepted safety regulations. On the difficulties experienced by Mr. Higgs regarding relations between general foremen and trade union officials, he suggested that trade unions were at their best when operating as trade unions; the difficulty was that in some cases there appeared to be political complications.

Bonus Schemes.—Mr. Reynolds had experienced no difficulties on bonus schemes, and had found that they encouraged men to do the job quickly. His firm did not change bonuses unless a better method had been found, when of course a new scheme had to be worked out.

Tendering.—Finally, Mr. Reynolds referred to Mr. Cave's views on selective tendering and suggested that there was no difficulty if arrangements were made for the contractor to be called in before drawings were completed.

BOOKS

*** Books reviewed in these columns may be obtained on application to the Book Dept., 'The Builder,' 4, Catherine-street, Aldwych, WC2. Cash (which should include 1s. to cover postage and packing) should accompany the order.*

THE RENT ACT 1957. By Robert Steel, BSc(EstMan), of Gray's Inn, Barrister-at-Law, Assistant Secretary, RICS. (London: The Royal Institution of Chartered Surveyors.) Price 15s.

THE full title of this book is 'The Rent Act 1957 and other legislation dealing with controlled tenancies and furnished lettings in England, Scotland and Wales, and long tenancies in England and Wales.' The book is in fact an excellent summary of the statutory provisions relating to the rents of controlled dwellings and of various other matters dealt with by the 1957 Act.

Although the 1957 Act makes drastic changes in the system of fixing maximum rents for controlled houses, what remains of the earlier legislation is still of great importance. Mr. Steel's introductory chapter on the Rent Acts generally is thus particularly useful; it includes, for instance, a concise summary of tenancies excepted from the pre-1957 Rent Acts. In subsequent chapters Mr. Steel deals fully with the new system of controlled rents in England and Wales and with the quite different system which operates in Scotland. There follow chapters on furnished lettings, long tenancies and the other matters dealt with in the new Act.

The appendices include examples of calculations of rent increases, tables of gross and rateable values for London and elsewhere, and a complete list of the areas included in the metropolitan police district. Mr. Steel has not adopted the practice, now common in books of this type, of publishing the text of the appropriate statutes and regulations. Many readers would no doubt have found it useful if this had been done, particularly in view of the repeals and amendments of the earlier statutes; on the other hand, the result would have been a much larger and, doubtless, more expensive book. As it is, the appendices and index occupy only 31 out of 164 pages. This means that the author has devoted 133 pages of comparatively small print to the substantive text, and this is an impressive tribute to the thoroughness of his work.

Mr. Steel has not devoted much attention, however, to case law. One example may suffice to show how valuable some reference to decided cases would have been. The new Act provides that in certain cases the outgoing tenant of decontrolled premises may claim compensation for improvements, provided the improvement was not a fixture 'which the tenant is by law entitled to remove'; the author gives no guidance at all as to the interpretation of this phrase. No doubt the book has been written for surveyors and property managers rather than lawyers, but one would have thought that this was the type of guidance that many surveyors would have welcomed.

Within the limits the author has chosen, however, this is a first class book.

A. E. T.

SPORTS BUILDINGS AND PLAYING FIELDS. By Richard Sudell and D. Tennyson Waters. 240 pages. (London: B. T. Batsford, Ltd.) Price 63s.

WHERE should children be when their parents are enjoying themselves at the local sports club? This book suggests one excellent answer. Provide a separate playground for them at the club itself. Equally as objective is the appeal to local authorities, in the foreword by Sir George Pepler, to treat sports grounds as essential elements in new town planning schemes instead of leaving it to enthusiasts to cajole them into allocating some waste land for a sports centre, long after the planning stage is past.

A few authorities cognisant of the appalling danger to children on the roads have, with good sense, laid out traffic-playgrounds—scaled down replicas of actual thoroughfares, away from traffic—where children can walk and ride their bicycles in safety whilst conforming to a rudimentary Highway Code. But such isolated altruism is insufficient. There is need in this country for more facilities for amateur sportsmen who, once they leave school, frequently have no well laid out playing field and club-house within miles of their homes.

The National Playing Fields Association, of which Mr. Sudell (a PPILA) is an active member, has already done much to ameliorate this deficiency. His co-author, Mr. Waters, is an architect and together they have produced a book which is a contribution to the ideal of playing fields for all. Both write easily in a somewhat esoteric realm which is inhabited by those who design club-houses or lay out games pitches. They display, throughout the book, a wide knowledge of sport and its concomitants.

Great Britain has not, until the Crystal Palace project, been noted for grandiose schemes for stadia or sports centres—that is the prerogative of Continentals and the American Republics—yet the authors shrewdly choose for their illustrations projects and completed schemes of recent date which represent the trend in this sphere in the UK as a whole. The predominance of English examples allows a serious investigator scope for a site visit. If some of the fields are large, most pavilions are small, but only one, that at Taunton School, Somerset, can be called stolid. The rest, if not startling, are adventurous.

The book is practical and at times philosophic. Discussing playgrounds the authors write, 'children like to express themselves in making something out of old junk, and will do so in preference to reducing good material to waste by sheer vandalism and destruction.' Conversely, they occasionally display a tendency to state the obvious. In the chapter on internal detailing of buildings they write, of serveries, 'the waitresses collect the prepared plates and pass out of the servery at one end, and return at the other with the used dishes.'

In the main they most adequately discuss facilities for track and field sports, golf, water sports (including sailing) and indoor games (including gymnasia activities). Equestrian and power sports, skiing, gliding, etc., are ignored as being outside the scope of the book. There is an excellent chapter on optimum sizes for most common games pitches. Throughout the book are useful maxims for estimating, for example, assembly room sizes, the number of change rooms and kitchens and the like. The numerous drawings are lucid and informative.

Without implying the impossibility, without this book, of successfully designing a club-house or planning a playing field, anyone connected with providing or maintaining sports grounds will find it useful and illuminating whether his need be to lay out a composite cycle/athletic track or simply authoritatively to discuss grass seed with a groundsman. However, it is all very well for the authors to write, when discussing club bars, 'the atmosphere should be a contemporary equivalent of that experienced in ancient inns.' Yes. But how?

ARCHITECTS' WORKING DRAWINGS. Edited by D. A. C. A. Boyne and Lance Wright. 160 pages. (London: The Architectural Press.) Price 25s.

IN this, the fourth volume of detail sheets selected from 'The Architects' Journal,' a widely cast net has collected 72 diverse designs which range in type and size from a clock or a litter bin to a spiral stair or curtain walling. Interesting or commendable as most of the designs are, it is obvious that each appears because of some aesthetic or functional gimmick. In this light it is difficult to assess the true value of the book. Its acceptance as a neatly parcelled presentation of good ideas must involve the question of motive. It is a fair assumption that an inventive, practical, experienced architect needs no more than a broad acquaintance with current architectural thought, obtainable from specific books or the glossy magazines specialising in one architectural *coterie*. The question is, then, does this garnished oblation open the portals wide for mediocre minds shamelessly to copy another man's ideas?

Seizing the initiative the authors plead, 'take each drawing as merely indicating the latest stage to which a design problem has been advanced, and thereupon refine and improve upon it. . . .' Thus they exonerate themselves from advocating base practices. But are they being philanthropic or are they heralds of a clique of, admittedly, adventurous minds of the secondary-modern-architectural school?

PETER RAWSTORNE.

FLUORESCENT LIGHTING

Recent Developments in Lamp Design and Performance

By J. B. Harris, AMIEE, FIES

AN appreciation of the properties and characteristics of the many and various types of electric light sources available is essential for the planning and successful functioning of modern lighting systems. In particular, an up-to-date knowledge of the many developments in fluorescent tubes is necessary, as these lamps often become an indispensable component of architectural lighting practice.

1.—Advantages

The main advantages of hot cathode fluorescent lamps are as follows:

(a) *Luminous Efficiency.*—Due to the method of light production employed, the fluorescent lamp has a luminous efficiency three to four times greater than that of a tungsten filament lamp. This in itself enables higher values of illumination to be attained with a possible accompaniment of savings in electrical energy costs. The relative 'average through life' emissions of both types of lamps are shown in Fig. 1, from which it can be seen, for instance, that an 80-watt 'white' fluorescent tube has a light output equal to that of a 300-watt tungsten filament lamp.

(b) *Rated Life.*—The life of a fluorescent lamp is at least five times that of a general service tungsten lamp. Although the former is more expensive initially, savings are effected during operational life due to fewer lamp replacements. It is even possible to obtain free replacements for fluorescent tubes which, under approved operating conditions, do not achieve a 3,000-hour life.

(c) *Heat Output.*—The total heat generated by fluorescent sources is about 30 per cent. of that of incandescent filament lamps of similar light output. The radiated heat component is about 16 per cent., and this becomes of importance where fittings are mounted close to operatives as in local bench lighting, or high values of general illumination are desired as in shop windows, gauge rooms, etc.

(d) *Colour.*—By using a special fluorescent powder, light having colour rendering properties akin to that of a north sky is obtained. The efficiency of this system of artificial daylight production is far greater than other methods involving the use of tungsten filament lamps and filters.

These fluorescent lamps, known as 'colour matching' or 'Northlight,' are suitable for industrial processes requiring fairly accurate colour discrimination. They should not be used for the general lighting of interiors at the normal economical intensities of illumination usually adopted, as a psychological effect of 'coldness' will result.

2.—Operational Characteristics

Fluorescent lamps are of the electrical discharge type and have to be operated on AC supplies in conjunction with a current limiter and a starting device. Additional equipment and switch wiring is necessary if lamps are connected to DC mains, the net result of which is a reduction on overall luminous efficiency. In the circumstances, therefore, it is questionable whether 'direct current' installations are an economic proposition.

For use on AC any of the following types of control gear can be supplied:

(a) *Starter Switch.*—Current control, improvements of power factor and initiation of discharge are provided by a choke, a condenser and a 'thermal' or 'glow' type starter switch. The latter heats the lamp electrodes and the starting period is about three seconds. Modern switches together with radio suppressors are enclosed in small metal canisters. They have a life which usually extends to that of three fluorescent lamps.

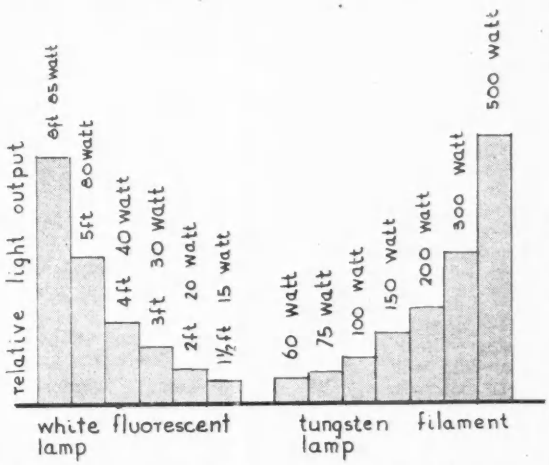


Fig. 1—Relative 'average through life' emissions of fluorescent and tungsten filament lamps.

(b) *Switchgear.*—Almost instantaneous starting can be effected in numerous ways and in many of the patented units available a filament-heating transformer is used in place of the consumable starter switch. The necessary components are generally supplied, ready wired, on a tray. Sometimes they are enclosed in a sheet steel case filled with a 'tropical grade' compound. Flashing or false starting is avoided, thereby benefiting lamp life and performance.

It is usually recommended that standard 'earth strip' or 'siliconed coated' fluorescent tubes be used, but several manufacturers offer circuits which, provided fittings are earthed, will operate normal untreated lamps.

An instant-start circuit is available for a standard 4-ft. 40-watt tube in which a special 65/70-watt tungsten ballast lamp is used in lieu of a choke. The only other components are an electric heating transformer and a suppressor condenser. This arrangement is economical both in initial and running costs if adequate use is made of the tungsten lamp light emission.

In the simplest AC circuit of all, a special 4-ft. 40-watt fluorescent lamp is series connected with a special 70/75-watt tungsten filament lamp. The latter is supplied with an opal glass bulb, a bowl silvered pearl bulb or an 'internal' reflector 'spotlight' bulb. Special simple pin lampholders are necessary, but ease of installation and very low initial cost commend this arrangement in instances where an additional tungsten light component is desirable—e.g., improving colour rendering or providing 'accent' lighting as in shop window, display and decorative lighting. Various designs of fittings, constructed for this circuit, can be purchased ex-stock. Alternatively, the lamps can be incorporated as individual components, in 'tailor-made' luminous features and integrated lighting elements. The total light emitted by the two lamps (combined wattage 115) is approximately the same as that of a normal 200-watt tungsten lamp; thus there is an appreciable saving in current costs.

3.—Types of Lamps

(a) *Colours.*—Fluorescent lamps, for general purpose use, are available in six standard 'whites'—viz: white, daylight, natural, warm white, de luxe warm white and colour matching (northlight). Recommendations are made according to the task or interior — e.g., 'white' or 'warm white' for offices, 'de luxe warm white' for hotels and restaurants, 'daylight' for floral displays, but personal preferences are often an influencing factor.

Luminous efficiency varies with 'colour' of emitted light, but decisions will be influenced by the relative importance of the quality and quantity factors of the particular lighting scheme. Fluorescent tubes emitting strongly coloured red, blue, green, pink and yellow light are marketed as standard in 80-watt ratings. They are specially useful for decorative lighting effects, fountains and garden lighting, floodlighting and stage lighting, and possess much higher efficiencies than tungsten lamps combined with subtractive colour filters.

(b) *Lengths and Ratings.*—Lamps vary in length, diameter and wattage, as indicated in Table 1. They are not marked in volts and, provided the correctly rated control gear is employed, they may be used on any domestic AC supply.

When planning features such as cornices and luminous panels, the indiscriminate 'mixing' of various lengths should be avoided, as surface brightness and light output per foot vary according

to lamp rating. The 5-ft. 80-watt and 8-ft. 125-watt lamps are comparable, but differ in brightness, etc., from the 4-ft. 40-watt lamp. Lamps of 1-in. diameter, such as the 30-watt and 50-watt ratings, are very useful where accommodation is restricted—e.g., showcases. Short-length tubes can be used for local lighting purposes—e.g., table lamps, hand lamps, signs, workshop brackets.

(c) *Reflector Fluorescent Lamps.*—These are available in 4-ft. 40-watt and 5-ft. 80-watt ratings, and have gained favour where it is desired to increase directional luminous intensity without using external reflectors. The diffusing reflector layer of powders covers two-thirds of the tube circumference and intensity in the preferred direction is about 1.8 times that of a normal lamp. Another advantage is that periodic depreciation in light output due to dirt collection is greatly reduced. These lamps will prove useful in dusty atmospheres, therefore, but unless concealed from view they should not be installed without diffuser or louvre control.

(d) *Caps and Holders.*—All lamps are available with bi-pin caps and the 80- and 125-watt sizes are also supplied with bayonet caps. Of the many varieties of bi-pin holders available those of the spring-loaded type are preferred, as they facilitate lamp replacement and lessen the risk of pin damage during insertion. If, as sometimes occurs in 'built-in' lighting effects, fixed holders cannot be used, consideration should be given to the 'push on' friction type. These, of course, necessitate the use of fixed lamp clips.

(e) *Ultra-Violet Tubes.*—These are obtainable in 5-ft., 4-ft. and 2-ft. lengths for use with special 'Woods glass' filters. The invisible ultra-violet radiation will cause certain chemically treated materials to appear self-luminous, which fact is used to advantage in many spectacular displays.

Control gear, lampholders, etc., are the same as for normal-type tubes. Less space is required than for conventional, high-pressure, mercury-vapour 'Black' lamps, and 'instant' starting is possible.

4.—Dimming

Fluorescent tubes can be 'varied' in light output with the same ease as is possible with tungsten lamps, using standard dimming equipment. This leads to economic advantages in connection with large-scale auditorium or stage installations in cinemas, theatres, concert halls, fountains and gardens. Small dimmer switches can be obtained for commercial applications, such as window lighting displays, X-ray viewing cabinets, inspection panels.

5.—Load Estimating

The number, type and positioning of fluorescent lamp fittings required for a particular interior should be decided in accordance with normal illumination design procedure. It is often necessary, however, to make a preliminary estimate of the lighting load for a complete building. Calculations can be made based upon electrical loading per unit area and the data given in Table 2 will be found useful, if applied with reserve.

6.—Specification

A number of relevant BSI Specifications have been issued to which reference should be made. Those available to date are as follows:

BS 2818—Auxiliaries for operation of Fluorescent Lamps.

BS 2467—Minimum Safety Requirements for Lighting Fittings (for use with Fluorescent Lamps).

BS 1875—Bi-pin Lamp Caps and Lampholders (for Fluorescent Lamps).

BS 1853 — Tubular Fluorescent Lamps (for general lighting service).

Care must be taken in respect of wiring and installation and the requirements of Section 7 of the IEE Regulations should be observed where applicable.

ROAD TRANSPORT ACCIDENT FIGURES

Ministry Analysis

UNSAFE loads and defective brakes are the principal causes of accidents to load-carrying vehicles, according to figures given in 'Road Accidents 1956,' issued as a Blue Book by the Ministry of Transport and Scottish Home Department.

Of over 200,000 accidents analysed, 7,000 were attributed mainly to mechanical defects, and light goods vehicles were involved in 1,210 of these. After overloading and shifting loads (263 cases) and brake failures (232 cases), blame is apportioned to tyres and wheels (140), steering (130) and absence of a rear light (112).

It is interesting to note that the bias alters slightly in the case of heavier commercial transport, where brake defects are given as the main cause, followed by difficulties with the load. Tyres are blamed for a low proportion of accidents to such vehicles.

Of accidents attributed to the driver's behaviour rather than to vehicle defects, goods vehicles were involved in some 22,500 cases out of the total of 140,000. Light vehicle drivers showed the same main fault as the general body of motorists—turning right without due care, and carelessness at road junctions. The principal sin of drivers of heavier vehicles was overtaking improperly; 48 per cent. of all accidents on straight roads occurred when a vehicle was overtaking.

Comparison of the figures for goods vehicle drivers with those for road users as a whole suggests that the standard of driving in this field is better than normal; on the other hand, the figures relating to mechanical defects suggests that maintenance standards by commercial operators should be improved.

Significant points are that the most dangerous times for drivers are 8 a.m. to 9 a.m. in winter and 5 p.m. to 6 p.m. in summer. Skids are shown to be more likely on wet roads in summer than in winter.

TABLE 1.—FLUORESCENT LAMP RANGE

Lamp Watts	Total Watts including control gear losses (approx.)	Nominal lamp length (ft.)	Nominal lamp diameter (in.)
125	145	8	1½
80*	100	5	1½
50	62	5	1
40*	52	4	1½
40	50	2	1½
40†	52	circle of 16 in. dia.	1½
30	42	3	1½
30	42	3	1
20	26	2	1½
15	21	1½	1½
15	21	1½	1
8	13	1	⅝
6	11	¾	⅝
4	9	½	⅝

The above lamps are available as standard in white, warm white, daylight, natural, colour matching (Northlight) and de luxe warm white, except as follows:—

(*a*) 5 ft. 50 watt—white, warm white and natural only.
(*b*) 8 ft. 125 watt—all colours other than de luxe warm white.
(*c*) 4, 6 and 8 watt in cool white (colour 33) only.

Lamps marked * are available with internal reflector coatings in white, warm white, daylight and natural. Lamps marked† available in de luxe warm white only.

TABLE 2.—ESTIMATING TABLE

Type of fitting (housing one 80 watt white fluorescent lamp)	Watts required per sq. ft. of floor area, to give an average service illumination of 15 ft. cdls.*
White enamelled trough reflector with open ends and slotted top	0.7
White enamelled batten with opal plastic louvres clipped to lamp	0.95
Half cylindrical or V-section glass or plastic diffuser	1.06
Indirect lighting from bare lamps concealed in cornice (ceiling 9 ft.-13 ft. 6 in. high)	2.56
Indirect lighting from pendant (ceiling 9 ft. - 13 ft. 6 in. high)	1.45

Relative light outputs for other colour designations, taking white as unity, are:—Warm white, 0.98; daylight, 0.95; natural, 0.74; colour matching, 0.7; and de luxe warm white, 0.61.

* Based on (*a*) Room dimensions:—Length, 42 ft.–90 ft.; width, 19 ft.–22 ft.; (*b*) mounting height of fittings 6 ft.–8 ft. 6 in. above working plane; (*c*) ceiling and wall reflection factors 70 per cent and 50 per cent respectively; (*d*) total load per fitting 100 watts.

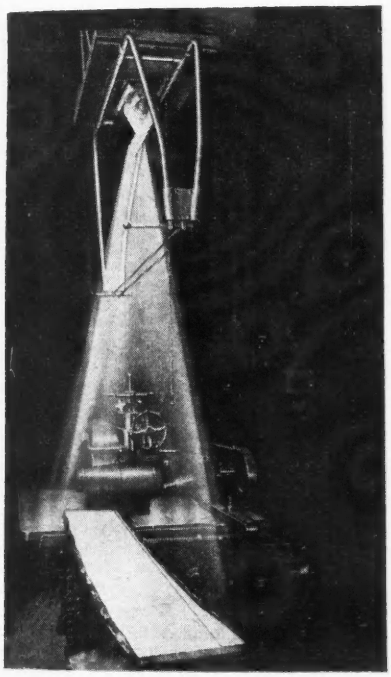
The Builder Review of PLANT & MATERIALS

Revised Colour Range

THE Walpamur Co., Ltd., of Darwen, Lancashire, have recently revised the colour ranges of their products, including Walpamur water paint, 'Duradio' and 'Muromatte.' The Walpamur range now affords 44 colours, the Duradio 46, the Muromatte 33 and, in most cases, the same shade can be obtained in both the matt and the gloss paints. All shades in the colour range are intermixable. Colour cards available.

Line Guide

Savings in waste wood of up to eight per cent. when cutting round timber and a further four to ten per cent. on edging work are claimed to be possible with the use of the Type H 'Shadow Line Guide,' now available from Thomas White and Sons, Ltd., of



Shadow-line guide

Laighpark, Paisley, Scotland, who are sole United Kingdom agents for the equipment. The Type H model is designed for use with heavy duty edging saws with automatic feeding. Mounted above the machine the Shadow Line Guide casts a shadow line along the edge to be cut, thus saving operating time as there is no need for preliminary marking out of the timber. Output of the edging saw is, therefore, speeded up considerably.

Special Primer

After sustained research, Allweather Paints, Ltd., 36, Great Queen-st., London, WC2, announce a special primer for application to moist concrete, asbestos cement, plaster, brickwork and other similar surfaces. It is called 'Pitan M. C. Primer' and contains a special chemical which is said to react with existing moisture converting it into a harmless fluid which rapidly evaporates from the paint film leaving the surface and paint absolutely dry.

New Burner Watcher

A new burner control box, the 'Spediflam,' produced by Teddington Industrial Equipment, Ltd., incorporates a number of features which make it, it is claimed, the most advanced form of protection available for oil-burning installations. It will be fitted to the oil burners used to fire the boilers for the heating plant at next year's World's Fair in Brussels. Among the new safety factors is a reset button which is positively isolated from the control circuit until the full purge period has elapsed, thus ensuring constant purging time under all conditions. In addition, there is a positive timed ignition period after flame is established. The 'Spediflam II' has a specially designed constant torque magnetic clutch for positive, rapid shut-down on flame failure with minimum temperature drop. Low voltage and high voltage terminal blocks have been incorporated on opposite sides of the chassis giving increased electrical safety. The overall size of the unit is only 6½ in. by 5 in. by 3¾ in. with a total weight of less than 5 lb.

TRADE NEWS

Prestige Publicity Production

A 115-PAGE, cloth-bound book has recently been published by George Wimpey and Co., Ltd., Hammersmith-grove, London, W6. Entitled 'Redevelopment in Wimpey no-fines concrete,' it is an extremely lavish production covering thoroughly all aspects of this form of construction in housing. The contents include, among 23 sections, a great many coloured photographs of completed contracts, models and perspectives. These illustrations are backed up with a wealth of technical information with plans, constructional details, tabular information and so on. Other sections cover history, research and analysis. Restricted distribution only.

Steelwork Contract

Light Steelwork (1925), Ltd., Hythe-road, Willesden, NW10, have entered into a contract with Higgs and Hill, Ltd., for the supply and erection at the BBC Television Centre, Shepherds Bush, of steel staircases, balustrades, handrails, railings, lighting galleries, cat walks, platforms, cat ladders, guardrails, etc.

Canadian Agent

From September 1 last the sole agent in Canada for 'Tornado' fan engineering equipment manufactured in London, England, and Arbroath, Scotland, by Keith Blackman, Ltd., is Norris Warming (Canada), Ltd., 640, Cathcart-street, Montreal. This office is under the control of Norman Shergold.

Regional Office

Nuralite Co. Ltd., of Gravesend, have opened a Regional Office at 1-3, Parliament-square, Hertford. The manager is J. F. Earp.

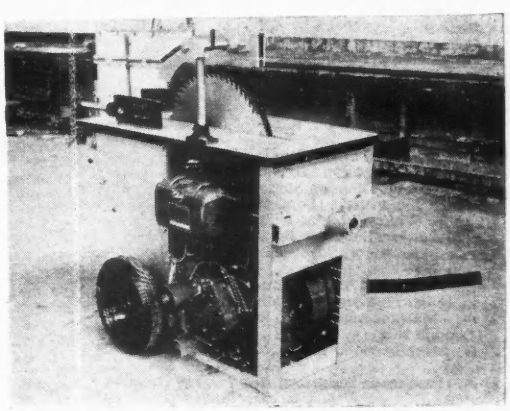
Fluorescent Tube Price Down

A reduction from 25s. to 20s. in the price of Osram 8 ft. 125W guaranteed tubes by General Electric Co., Ltd., Magnet House, Kingsway, WC2, became effective on September 9, last. The tubes are not subject to purchase tax.

A special guarantee is being offered to all users of Osram standard straight fluorescent tubes in the range 1½ ft. to 8 ft. Free replacements will be given if any new tubes fail before 3,000 hours or one year of use, whichever is the shorter. Osram Tubes are made by the General Electric Co., Ltd., Magnet House, Kingsway, WC2.

Plywood Distributors

F. Hills and Sons, Ltd., announce the appointment of two distributors of 'Duramel,' the plastic-faced plywood. They are: L. Keizer and Co., Ltd., 33, Hunslet-road, Leeds, 10. Telephone: Leeds 27498/9, and D. W. Beattie Ltd., 20, Baltic-street, Leith. Telephone: Leith 35246/7.



PORTABLE SAWBENCH.—A recent development by James F. Low and Co., Ltd., Monifieth, Dundee, Angus, Scotland, is available in portable and high-speed towing versions. The portable model has retractable wheels, the overall dimensions being 4 ft. 8 in. long by 3 ft. 1 in. wide and 4 ft. high. Power unit is a Petter PH1 ICE and drive is by multiple V-belts

The Builder

CURRENT PRICES OF MATERIALS

THE information given on these pages has been specially compiled for *The Builder* and is copyright. It is the intention that the details given should indicate fair average prices of materials, not necessarily the highest or the lowest. The prices apply to large quantities of materials loaded at works, delivered at London Stations or at site in London Area as stated. Prices for smaller quantities ex merchant's warehouse will necessarily be higher so as to include the stocking and handling costs involved. Due to the exceptional circumstances now prevailing it is recommended that the prices of materials should be confirmed by inquiry from suppliers and merchants.

AGGREGATES AND SAND

Delivered site in full lorry loads. Average of prices for Boroughs of Westminster, Paddington, Holborn and St. Pancras.

		£	s.	d.
Pit Ballast	per yd.	1	7	1
Pit Sand	,,	1	4	6
Washed Sand	,,	1	7	8
¼ in. Shingle	,,	1	4	0
¼ in. Broken Brick	,,	1	0	9
Pan Breeze	,,		10	9
Fine or Coarse Foamed Slag Aggregate ... 2 yds. of fine and 2.6 yds. of coarse per ton.	per ton	3	5	0

CEMENT, etc.

Including non-returnable jute sacks or paper bags.

		£	s.	d.
Best British Portland Cement. Standard Specification delivered Charing Cross area.				
6-ton loads and upwards, site	per ton	5	12	0
1 to 6 tons, site	,,	6	4	0
Rapid Hardening Cement in 6-ton loads and upwards to site	,,	6	2	6
1 to 6 tons do. site	,,	6	14	6
Aquacrete Water Repellent Cement. 32s. 6d. per ton on ordinary cement prices.				
Sulphate Resisting Cement. 32s. 6d. per ton on ordinary cement prices.				
Red, Buff or Khaki Colorcrete in 6-ton lots	,,	8	12	0
Other colours according to colour.				
In 4-ton lots from 310s. 0d. to 780s. 0d. per ton.				
White Portland Cement	,,	13	17	6
Under 1 ton	per cwt.		16	11
417 Cement (Ultra Rapid Hardening) in 6-ton lots and upwards	per ton	7	4	6
Super Cement (Waterproof), 32s. 6d. per ton above Portland Cement.				
Cullamix Tyrolean Finish, £11 10s. 0d. to £14 5s. 0d. (1-ton loads and upwards).				
Lightning and Ciment Fondu Brands High Aluminous cement, 6-ton lots and up	,,	15	14	6
Stourbridge Fireclay, 6-ton loads at Railway Depot, London	,,	6	17	6
Moler Mortar Powder for Flue Bricks (London sites)	per cwt.	1	10	0

BRICKS

		£	s.	d.
Full Loads.				
First Hard Stocks	per 1,000	13	14	6
Second Hard Stocks	,,	12	13	6
Mild Stocks (Kiln Burnt)	,,	9	4	0
Mild Stocks	,,	8	19	0
All loaded free into lorry at the works. The question of haulage is still very difficult and prices must be obtained from job to job.				
2½in. Nominal Fletton Bricks to sites in W.C. District Commons	,,	5	18	0
Cellular do.	,,	5	18	0
Keyed do.	,,	6	0	0
Rustics	,,	7	10	0
Cellular Rustics	,,	7	10	0
Single Bullnose Commons	,,	7	12	6
Sandfaced	,,	8	10	0
Tuscans	,,	9	5	0
Saxons	,,	9	13	0
Golden Buffs	,,	10	0	0
Dapple Light	,,	10	7	6
Best Blue Pressed Staffs (London Stations)	,,	29	15	6
,, Bullnose (London Stations)	,,	30	9	6
Blue Wire Cuts (London Stations)	,,	26	15	6
Midhurst Lime Bricks (London sites)	,,	10	15	6
Uxbridge Whites (London sites)	,,	10	2	0
Special Purpose Sandlime Bricks (London sites)	,,	7	18	6
2½ in. Best Stourbridge Fire Bricks (London Stations)	,,	29	9	9
3 in. do. (London Stations)	,,	35	7	9
2½ in. Moler Flue Bricks (London sites)	,,	36	0	0
2½ in. Machine-made Sandfaced Red Facings (London sites)	,,	15	18	6
2½ in. Machine-made Multi Red Facings (London sites)	,,	16	3	6
2½ in. Hand-made Sandfaced Red Facings (London sites)	,,	15	18	6
2⅝ in. Hand-made Sandfaced Multi-Colour Facings (London sites)	per 1 000	16	13	6
Hand-made Sandfaced Cherry Red Facings, Berkshire district (London sites)	,,	18	14	0
Hand-made Sandfaced Multi-Colour Facings. Berkshire district (London sites)	,,	18	14	0
Rubber Bricks for gauged arches (London sites)	,,	42	17	6
2⅝ in. Surrey Clamp Burnt Multi Stock Facings (London sites)	,,	14	4	0
2⅝ in. Surrey Kiln Burnt Multi Stock Facings (London sites)	,,	15	16	0
Glazed Bricks (London sites), White, Ivory, Brown— Stretchers	,,	64	0	0
Headers	,,	63	0	0
Quoins, Bullnose and 4½ in. Flats	,,	80	0	0
Double Stretchers	,,	85	0	0
Double Headers	,,	77	10	0
One side and two ends	,,	87	0	0
Two sides and one end	,,	89	10	0
Splays and Squints	,,	83	0	0
Cream and Buff £3 extra over White. Other colours, hard glaze, £8 10s. 0d. extra over White. All above prices plus 32½% for Best quality and plus 32½% less 10% for Second quality.				

PARTITION SLABS, etc.

Delivered Central London Area. (W.C. District.)

	Minimum lorry loads				
HOLLOW CLAY PARTITION BLOCKS (Keyed)					
*2 in.	140 yds.	per yd. sup.		4	5
*2½ in.	140 yds.	,,		4	8
*3 in. (3 cavity)	120 yds.	,,		5	5
BUILDING BLOCKS (Keyed)					
*3 in. (6 cavity)	110 yds.	,,		5	7
*4 in. (6 cavity)	95 yds.	,,		6	10
6 in. (8½ in. × 5⅝ in.)	1,250 blocks	per 1,000	26	18	0
*Half blocks at no extra charge.					
CLINKER CONCRETE					
2 in.	100 yds.	per yd. sup.		3	9
2½ in.	85 yds.	,,		4	4
3 in.	75 yds.	,,		5	3
4 in.	55 yds.	,,		6	5
CRANHAM					
2 in.		,,		6	9
2½ in.		,,		7	5
3 in.		,,		8	9
4 in.		,,		10	9
4¼ in. Load bearing quality		,,		11	10
MOLER PARTITION BLOCKS					
2 in.	150 yds.	,,		15	0
2½ in.	120 yds.	,,		15	6
3 in.	100 yds.	,,		16	0
4 in.	90 yds.	,,		19	0
LIGHTWEIGHT CONCRETE BUILDING AND PARTITION BLOCKS OF VARIOUS SOURCES OF MANUFACTURE					
2 in.	100 yds.	,,		5	10
2½ in.	80 yds.	,,		7	0
3 in.	65 yds.	,,		8	2
4 in.	50 yds.	,,		9	8
4½ in.	44 yds.	,,		10	4
6 in.	33 yds.	,,		13	10½
THERMALITE-YTONG PARTITION BLOCKS					
2½ in.	144 yds.	,,		7	0
THERMALITE-YTONG LOADBEARING INSULATING BLOCKS					
3 in.	120 yds.	,,		8	5
4 in.	90 yds.	,,		11	0
5 in.	72 yds.	,,		13	9
6 in.	60 yds.	,,		16	6
8½ in.	42 yds.	,,	1	3	8
FLOOR BLOCKS AND FILLER TILES					
3 in. Floor Blocks 12 in. by 12 in. delivered in full lorry-loads		per 1,000	34	1	0
4 in. do		,,	36	10	0
5 in. do.		,,	43	15	0
6 in. do.		,,	49	19	0
7 in. do.		,,	61	8	0
8 in. do.		,,	71	19	0
12″×3″×⅝″Filler Tiles in multiples of 10 tiles	per 1,000 multiples		42	15	0
12″×4″×¼″ do. do.			73	15	0

STONEWARE DRAIN PIPES, etc.

The following are the percentages to be added to the Revised Standard List (Nov., 1956) prices delivered London Area.

Delivered ex Merchants Wharf or Depot or Manufacturers Works.	Over 2 tons	Over 100 pieces Under 2 tons	Under 100 pieces Under 2 tons
Best Quality	−2½%	+15%	+22½%
BSS Best do.	+10% −2½%	+10% +15%	+10% +22½%
Tested Quality	+37½% −2½%	+37½% +15%	+37½% +22½%
BSS Tested do.	+47½% −2½%	+47½% +15%	+47½% +22½%

STONEWARE DRAIN PIPES, etc.—*continued*

	£ s. d.
3 in. Land Drain Pipes (in 12 in. lengths) ... per 1,000	11 10 6
4 in. do. ... ... ,,	15 3 6
6 in. do. ... ... ,,	31 9 0
9 in. do. ... ... ,,	51 13 0

DAMP COURSE

Hessian base bitumen 7 lb. per yd. sup. in 24 ft. rolls cut to wall widths in lots of £6 value and over delivered London area ... ... per yd. sup.	3 5½
Asbestos base ditto 7 lb. per yd. sup. do. do. ,,	5 3
Lead lined bitumen ditto 9½ lb. per yd. sup. do. ,,	12 2
18 in. × 9 in. British damp course slates ... ... per 1,000	43 8 11
14 in. × 9 in. do. do. ... ... ,,	32 8 2
9 in. × 9 in. do. do. ... ... ,,	18 18 9
18 in. × 4½ in. do. do. ... ... ,,	19 19 9
14 in. × 4½ in. do. do. ... ... ,,	15 18 3
9 in. × 4½ in. do. do. ... ... ,,	10 14 3

STONE

Bath Stone—	
Monks Park ... ... per ft. cube	9 4
St. Aldhelm Box Ground ... ... ,,	10 7
Delivered in railway trucks at South Lambeth B.R. Western Region.	
Doulting Stone Random Blocks. Delivered London area ,,	9 2
Beer Stone. Delivered London area ... ... ,,	8 9
Portland Stone—	
Brown Whitbed in random blocks, 20 ft. average delivered in railway trucks at Nine Elms, B.R. Southern Region ... ... ,,	8 8
Yorkshire Stone—Blue Robin Hood Quality. Delivered to site London in 6-ton lots.	
9 in. × 3 in. Rubbed, weathered, throated and stooled cills ... ... per ft. cube	4 1 9
12 in. × 6 in. do. do. ... ... ,,	2 18 3
12 in. × 3 in. Plain coping, twice throated ... ,,	2 5 3
12 in. × 3 in. Weathered and twice throated coping ,,	3 0 3
14 in. × 6 in. do. do. ... ... ,,	2 14 3
4½ in. × 9 in. Plinth rubbed on top and face ... ,,	2 8 6
3 in. sawn two sides Slabs, random sizes ... ... per ft. sup.	8 8
Templates and Cover Stones, 3 in., 4 in. and 6 in. thick, edges coped for rendered brickwork ... per ft. cube	1 9 9
do. do. fair one edge for fair faced brickwork ... ... ,,	1 15 3
Hard York—	
12 in. × 2 in. Square Steps, rubbed on top and edge per ft. run	10 6
14 in. × 3 in. Round-nosed Steps, rubbed on top and front ... ... per ft. cube	2 15 6
12 in. × 6 in. Plain Steps, rubbed top and front ,,	2 8 6
2 in. Rubbed and Jointed Paving, given sizes ... per ft. sup.	9 9
2 in. Sawn Paving, edges squared, in random sizes per yd. sup.	3 8 6

TILES AND PANTILES

Delivered London area by road in 6 tons or over per 1,000	
Machine-made Pantiles and French pattern Tiles from Lincolnshire district	29 19 0
Hand-made Pantiles Berkshire district	55 18 0
Hand-made Double Roman Bridgwater district	60 11 6
Hand-made 10½ × 6½ tiles Berkshire district	15 9 0
Machine-made 10½ × 6½ Staffordshire district	14 13 6
Hand-made Hip and Valley tiles per doz.	1 11 3
Machine-made Hip and Valley tiles do.	1 9 6
Concrete tiles 10½ × 6½	8 10 0
do. Interlocking (49S)	19 16 6

NOTE.—Breakage in transit, purchasers' responsibility.

SLATES

First-quality Slates from Penrhyn or Portmadoc, carriage paid in full truck loads to London Rate Station. Per 1,000 actual.	
24 × 12	143 15 10
22 × 12	116 17 4
22 × 11	105 10 10
20 × 12	99 0 1
20 × 10	94 16 9
18 × 10	65 16 9
18 × 9	57 14 0
16 × 10	51 17 0
16 × 8	40 11 9

NOTE.—Breakage in transit, purchasers' responsibility.

TIMBER

Softwood—				
Joinery quality	Ex Wharf	per standard	£115 to £140	
Carcassing quality ...	do.	,,	£97 to £102	
1 in. Tongued and Grooved Flooring	do.	,,	£110 0 0	
Hardwood—				
Mahogany—African S.E.	do.	per ft. cube	1 10 0	
do. Honduras do.	do.	,,	3 5 0	
Oak European do.	do.	,,	2 5 0	
do. Japanese do.	do.	,,	2 10 0	
do. English Logs sawn	do.	,,	2 0 0	
Teak 8 in. average S.E.	do.	,,	3 17 6	
Walnut African Logs sawn	do.	,,	1 5 0	

DOORS (in Lots I-II)

	£ s. d.
Delivered London area	
1¼ in. 4 Horizontal Panel. Pattern 4 in. deal	
2 ft. 0 in. × 6 ft. 6 in. ... ... each	1 16 0
2 ft. 3 in. × 6 ft. 6 in. ... ... ,,	1 17 6
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	1 18 6
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2 0 6
2 in. do. but top panel open. Pattern 4 × G in deal	
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2 9 0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2 11 6
2 in. 2 Panel top panel open. Pattern 2 × G in deal	
2 ft. 6 in. × 6 ft. 6 in. ... ... ,,	2 3 0
2 ft. 9 in. × 6 ft. 6 in. ... ... ,,	2 5 0

SUNDRIES

Delivered London area.	
1 in. Wood Wool Slabs 6 ft. 0 in. × 2 ft. 0 in. in quantities of 1 ton (89 yds. to 1 ton) ... ... per yd.	6 2
1½ in. do. (67 yds. to 1 ton) ... ... ,,	8 0
2 in. do. (52 yds. to 1 ton) ... ... ,,	9 9½
2½ in. do. (45 yds. to 1 ton) ... ... ,,	11 3
3 in. do. (39 yds. to 1 ton) ... ... ,,	12 7½
Quantities under 1 ton add 1d. per ½ in. of thickness.	
½ in. imported insulation Board, quantities over 5,000 sq. ft. per 100 sq. ft.	2 2 6
⅛ in. Hardboard do. ... ... ,,	2 1 6
3/16 in. do. do. ... ... ,,	3 2 6
1/16 in. Asbestos Flat Building Sheets ... per yd. sup.	4 3
¼ in. do. ... ... ,,	5 9½
Roofing Felt 1-ply ... ... ,,	1 9
do. 2-ply ... ... ,,	2 2½
Best Scotch Glue in slabs ... ... per ½ cwt.	5 0 0
do. pearl ... ... ,,	5 5 0
Croid Glue ... ... 28 lb.	2 6 0
Cut Nails 3 in. (1-ton. lots) ... ... per ton	73 0 0
do. 4 in. and up (1-ton lots) ... ... ,,	69 10 0
Wire Nails 3 in. (4-cwt. lots) ... ... per cwt.	3 13 11
do. 4 in. and up (4-cwt. lots) ... ... ,,	3 13 3

METALS

STEEL JOISTS, ETC.

Basis Joists—	
6 in. × 5 in., 8 in. × 5 in., 8 in. × 6 in., 10 in. × 6 in., 12 in. × 6 in. plain cut to lengths delivered London area ... ... per ton	51 2 6
Extra for sizes	
3 in. × 1½ in. 4 in. × 1½ in. ... ... ,,	3 10 0
3 in. × 3 in. ... ... ,,	2 10 0
4 in. × 3 in. ... ... ,,	2 5 0
10 in. × 4½ in. ... ... ,,	1 10 0
5 in. × 2½ in. 5 in. × 3 in. ... ... ,,	1 15 0
4½ in. × 1¾ in. ... ... ,,	3 5 0
5 in. × 4½ in. 7 in. × 3½ in. 13 in. × 5 in. ,,	15 0
6 in. × 3 in. 24 in. × 7½ in. ... ... ,,	2 0 0
6 in. × 4½ in. 7 in. × 4 in. 8 in. × 4 in.	
9 in. × 4 in. 10 in. × 5 in. ... ... ,,	1 5 0
12 in. × 5 in. 22 in. × 7 in. ... ... ,,	1 0 0
9 in. × 7 in. 10 in. × 8 in. 12 in. × 8 in.	
14 in. × 5½ in. 14 in. × 6 in. 14 in. × 8 in.	
15 in. × 5 in. 15 in. × 6 in. 16 in. × 6 in. ,,	10 0
16 in. × 8 in. 18 in. × 6 in. 18 in. × 7 in.	
18 in. × 8 in. 20 in. × 6½ in. 20 in. × 7½ in.	
Steel angles average price ... ... ,,	53 2 6
Steel tees average price ... ... ,,	54 2 6
Fabricated work delivered London—	
R.S. Joists cut and fitted ... ... ,,	70 12 6
Compound girders ... ... ,,	77 0 0
Stanchions ... ... ,,	82 10 0
Compound stanchions ... ... ,,	87 0 0
In Roof Work—Trusses and Purlins ... ... ,,	100 12 6
Average prices not for awkward work.	
Angle cleats and ⅝ in., ¾ in. and ⅞ in. bolts average price London area ... ... per cwt.	5 19 0

FERRO-CONCRETE BARS

Mild Steel Ferro-Concrete bars British manufacture to BSS785 ex London Stock ⅜ in. diam., and upwards ... ... per ton	49 17 6
¼ in. diam. ... ... ,, extra	8 12 ?
5/16 in. do. ... ... ,,	6 12 6
⅜ in. do. ... ... ,,	4 12 6
½ in. do. ... ... ,,	3 2 6

MILD STEEL TUBES

Tubes to BSS1387 and Fittings. List prices and following discounts :

Galvanised Tube—	Under 1 ton	Over 1 ton	W.I. Fittings	Malleable Fittings
Class A	+24½%	+21 %	Light +48 %	Malleable List
Class B	+37 %	+33⅓%	Heavy +55⅓%	−20½%+40%
Class C	+57 %	+53¼%		
Black—				
Class A	+ 4¾%	+ 1¼%	Light +35⅓%	Malleable List
Class B	+18½%	+15 %	Heavy +43⅓%	− 20½%
Class C	+34⅓%	+31¼%		

C.I. HALF-ROUND GUTTERS

Delivered London per yd. in 6-ft. lengths

	Gutters	Nozzles	Stop Ends
3 in.	4/0½	3/7	1/–
3½ in.	4/4½	3/11	1/–
4 in.	5/8	4/5	1/7
4½ in.	6/3	4/11	1/10
5 in.	6/11½	5/4	2/2

METALS—*continued*

C.I.O.G. Gutters

	Gutters	Nozzle	Stop Ends
3 in.	5/2½	4/8	1/3
3½ in.	5/10	4/8	1/7
4 in.	6/5	4/11	1/10
4½ in.	6/11½	5/8	2/2
5 in.	7/7½	6/5	2/6

C.I. Rain-water Pipes

Per yd. in 6-ft. lengths	Pipe	Bends	Branches
2 in.	8/7½	4/5	6/4
2½ in.	8/7½	4/11	8/6
3 in.	9/8½	6/2	9/2
3½ in.	11/0½	7/3	11/–
4 in.	12/9	8/9	13/1

L.C.C. Coated Soil Pipes

2 in.	9/8½	7/7	9/2
2½ in.	10/4	8/5	11/5
3 in.	11/7	9/2	13/7
3½ in.	12/11½	11/5	15/10
4 in.	14/9	12/9	18/8

Above prices for gutters, rain-water and soil pipes for under 5 cwt. lots only. Lots over 5 cwt. see List No. 3300 dated February 1, 1955, plus 22½% and tonnage allowance. 4-ton lots 5 per cent., 2-ton lots 2½ per cent.

L.C.C. Coated Drain Pipes

	In 9-fts. cwt.	qt.	lb.	per yd.	Bends	Branches
4 in.	1	1	17	33/6	23/3	41/3
6 in.	2	0	1	49/2	62/–	99/–

Asbestos Rain-water Pipes and Fittings

All less 17½ per cent. discount.

	2 in.	2½ in.	3 in.	4 in.
Pipes 6-ft. lengths ... ... per yd.	4/3	4/6½	5/6	7/3½
Shoes ... ... each	2/9	3/–	3/7	4/10
Single Branches ... ... ,,	4/4	5/1	6/1	8/6
Bends square or obtuse ... ,,	3/–	3/4	4/4	6/1
Swan Necks 4½ in. proj. ... ,,	3/4	4/4	4/10	6/9
,, 6 in. ,, ... ,,	3/7	4/4	5/5	7/3

Asbestos O.G. Gutters and Fittings

	4 in.	4½ in.	5 in.	6 in.
Gutters 6-ft. lengths ... ... per yd.	4/1	4/5½	5/4	6/4½
Drop ends ... ... each	3/3	3/9	4/5	5/2
Stop ends ... ... ,,	1/–	1/1	1/2	1/4
Angles ... ... ,,	3/4	3/10	4/8	5/5
Nozzles ... ... ,,	3/3	3/9	4/5	5/2
Union Clips ... ... ,,	1/7	1/11	2/4	2/8

Asbestos Half-Round Gutters and Fittings

	3 in.	4 in.	4½ in.	5 in.	6 in.
Gutters 6-ft. lengths per yd.	2/10	3/4½	3/5½	4/1	5/8
Drop ends ... ... each	2/4	2/9	3/–	3/4	4/10
Stop ends ... ... ,,	–/11	1/–	1/1	1/2	1/4
Angles ... ... ,,	2/8	3/–	3/4	3/7	4/10
Nozzles ... ... ,,	2/4	2/9	3/–	3/4	4/10
Union Clips ... ,,	1/2	1/3	1/4	1/6	2/3

	Per ton basis in London £ s. d.
Iron—Staffordshire Crown Merchant Quality	49 7 6
Mild Steel Bars	47 12 6
Mild Steel Hoops	44 2 6

	Ex Merchant's Stock per ton Two-ton lots £ s. d.
Soft Sheets C.R. and C.A.—	
20 gauge	62 14 6
24 gauge	65 4 6
26 gauge	68 4 6
Galvanised Corrugated sheets 6 ft. to 9 ft.—	
20 gauge	71 12 0
24 gauge	75 2 0
26 gauge	80 7 0
Galvanised flat sheets C.R. and C.A.—	
20 gauge	73 2 0
24 gauge	76 12 0
26 gauge	81 17 0

ALUMINIUM AND ALUMINIUM ALLOYS

(Base prices)		£ s. d.
Sheet BS 1740 S1C 18 SWG (36 in. wide)	per lb.	2 11
Sheet BS 1470 NS3 Utility 18 SWG (36 in. wide)	,,	2 8½
Coiled strip BS 1470 S1C 18 SWG (24 in. wide) ...	,,	2 10
Coiled strip BS 1470 NS 3 Utility 18 SWG (24 in. wide)	,,	2 8
Coiled strip for flashing 99.7% purity 22 SWG (12 in. wide)	,,	3 0½
Corrugated sheet BS 1470 NS 3 Utility Circular Profile 8 ft. × 32 in. × 20 SWG	per sheet	1 12 6
Corrugated sheet BS 1470 NS 3 Utility Industrial Profile 8 ft. × 31½ in. × 20 SWG	,,	1 18 1
Corrugated sheet BS 1470 NS 3 Utility Mansard Profile 8 ft. × 31½ in. × 20 SWG	,,	1 11 7
Extruded section BS 1476 E1C simple moulding ...	per lb.	2 9
Extruded section BS 1476 E1C 1 in. diam. round	,,	2 6½
Extruded section BS 1476 HE1WP simple angle ...	,,	3 0
Extruded section BS 1476 HE10WP 1 in. diam. round	,,	2 11
Tubing BS 1471 T1C 1½ in. O/D × 20 SWG ...	,,	4 4½
Tubing BS 1471 HT10WP 1½ in. O/D × SWG ...	,,	5 8

PLUMBERS' BRASS WORK, etc.

Delivered in London area.

M.O.H.

All per doz.	½ in.	¾ in.	1 in.	1¼ in.	1½ in.	2 in.
Screwdown bib cocks Crutch head for iron	87/–	128/8				
Toilet bib cocks for iron ...	109/–	158/5				
Screwdown stop cocks for iron	66/–	95/9	188/–	363/–	522/6	917/6
do. with two unions for lead	89/–	132/–	234/4	472/–	623/6	1389/6
Double nut boiler screws ...	18/8	26/5	47/6	48/6	67/–	93/6
Heavy Croydon ball valves ...	77/–	193/6	312/5	568/8	734/10	—
Plumbers' union brass lead to iron	19/6	23/6	38/6	52/10	70/6	165/–

	1¼ in.	1½ in.	2 in.	3 in.	3½ in.	4 in.
Caps and screws	33/–	40/8	59/6	92/5	118/10	155/3
Brass sleeves		31/11	31/11	56/2	74/10	91/5
	1¼ × 6 lb.		1½ × 6 lb.	2 × 7 lb.		3 × 7 lb.
Lead P. trap with brass cleaning screws	68/6		85/6	137/–		234/–
Lead S. Trap do.	83/–		102/6	168/3		302/–

Solder		s. d.
Plumbers'	1 cwt. lots 332/–	14 lb. lots per lb. 3 6
Tinmen's	,, ,, 408/–	,, ,, 4 1
Blow pipe	,, ,, 411/–	,, ,, 4 3

Copper Tubes and Sheets

Copper tubes BSS 659/1944 on the basic price of 22⅜d. per lb. plus gauge and manufacturing extras as follows. Minimum quantities, 3 cwt.

	Extra d.		d.
½ in. × 19 gauge ...	14¾	Total per lb.	37⅛ approx per ft. 10
¾ in. × 19 ,, ...	13	,, ,,	35⅜ ,, ,, 13½
1 in. × 18 ,, ...	11½	,, ,,	33⅞ ,, ,, 21
1¼ in. × 18 ,, ...	10⅞	,, ,,	33¼ ,, ,, 25½
1½ in. × 18 ,, ...	10⅞	,, ,,	33¼ ,, ,, 30½
2 in. × 17 ,, ...	12½	,, ,,	34⅞ ,, ,, 48½

Rolled Copper sheets up to 48 in. wide, basic price plus gauge and manufacturing extras ... ... per ton £217 0 0

Zinc

		£ s. d.
Sheet Zinc	10 gauge (25 SWG) 5 cwt. lots upwards per cwt.	7 7 0
do.	12 gauge (23 SWG) ,, ,,	7 5 9
do.	14 gauge (21 SWG) ,, ,,	7 4 6

Brass Tubes

		£ s. d.
Brass tubes basic price, plus gauge and manufacturing extras	per lb.	1 6¾

LEAD SHEET AND PIPES

Basis selling price in minimum one-ton delivery to one address in London or Home Counties.

		£ s. d.
Lead Sheet, English, 3½ lb. substance and upwards	per ton	130 5 0
Lead Water Pipe in coils	,,	132 10 0
Lead Soil Pipe 10 ft. or over 2 in. to 4 in. dia. ...	,,	134 0 0
,, over 4 in. dia.	,,	136 0 0
Lead Gas or Untinned Compo pipe	,,	134 0 0
Extras over Basis for quantities under 1 ton		
5 cwt. and under 1 ton	per cwt.	2 0
3 cwt. do. 5 cwt.	,,	4 0
1 cwt. do. 3 cwt.	,,	6 0

Smaller quantities than 1 cwt. priced specially.
Supplying sheet lead and lead pipe to less than basis weights and cutting to sizes less than basis charged extra according to current trade schedule.
Allowance for Old Lead, collected £80 15s. 0d. per ton weighed at buyer's works.

PLASTER, etc.

		£ s. d.
Coarse Pink in 1-ton loads and over Delivered on Site	per ton	8 9 6
do. White do. do. ...	,,	8 19 0
Siripite Coarse do. do. ...	,,	8 10 6
do. Fine do. do. ...	,,	8 18 6
Blue Lias Lime in 6-ton loads	,,	6 14 6
Hydrated Lime (Grey) do.	,,	5 17 6
do. (White) do.	,,	6 5 0
Lump Lime (Grey) do.	,,	5 7 0
do. (White) do...	,,	5 14 6
White Keen's or Parian Cement in 1-ton loads ...	,,	12 4 6
Pink Keen's or Parian Cement in 1-ton loads ...	,,	11 19 3
Granite Chips in 6-ton loads	,,	2 8 6
Hair	per cwt.	4 17 6
Gypsum Plaster Lath or Base Board ⅜ in. thick 600 yds. and over in one delivery. Delivered site ...	per yd.	2 5
1,200 yds.	,,	2 4
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site	,,	3 0
1,200 yds.	,,	2 11½
Gypsum Plaster Wall Boards, 3 and 4 ft. wide, 6 to 12 ft. ⅜ in. thick, 600 yds. and over in one delivery Delivered site	,,	2 8
1,200 yds.	,,	2 7
Do. Insulating do. ⅜ in. thick 600 yds. and over in one delivery. Delivered site	,,	3 3
1,200 yds.	,,	3 2½

PAINT AND DISTEMPER

	£ s. d.
Delivered London area	
Ceiling Distemper ... ... per cwt.	1 7 6
Washable Distemper ... ... ,,	5 5 0
Gloss Paint ... ... per gal.	2 12 0
Snowcem cement paint (in 1 cwt. drums) ... ... per cwt.	3 11 0
LEAD PRODUCTS AND OILS	
Ground White Lead, in 1 cwt. kegs ... ... per cwt.	8 18 3
Genuine White Lead Paint, 1-19 gal. lots in 1 gal. tins per gal.	3 9 6
Genuine Red Lead, Dry, 1 cwt. keg. ... ... per cwt.	6 7 9
Genuine Linseed Oil Putty, 1 cwt. keg ... ... ,,	2 14 0
Size XD quality 28 lb. ... ... per tin	9 0
Raw Linseed Oil (5 gal.) drums extra ... ... per gal.	18 6
Boiled Linseed Oil (5 gal.) do. ... ... ,,	19 0
SUNDRIES	
Turpentine substitute (5 gal.) drums extra ... ... ,,	5 3½
do. do. (40 gal.) do. do. ... ... ,,	4 7½
Solignum, Brown (5 gal. cans) Exterior ... ... ,,	8 4
Creosote (40 gal. barrels) ... ... ,,	2 3
Paste Powder (1 lb. packets) ... ... per lb.	1 10
White Lining Paper ... ... per piece	1 2½

VARNISHES, etc.

	£ s. d.
Delivered London area	
Oak Varnish, Outside or Inside ... ... per gal.	2 0 0
Oak Pale Copal do. ... ... ,,	2 0 0
Hard Drying Oak for Inside ... ... ,,	2 5 0
Crystal Paper Varnish do. ... ... ,,	2 8 0
Eggshell Flat Varnish do. ... ... ,,	2 6 0
Finest Carriage Varnish ... ... ,,	2 7 0
Front Door Varnish ... ... ,,	2 4 0
Japan Gold Size ... ... ,,	1 18 0
Black Japan ... ... ,,	1 16 0
Brunswick Black ... ... ,,	1 12 0
Berlin Black ... ... ,,	1 10 0
Terebene ... ... ,,	1 17 0
Knotting (1 gal. bottles free)... ... ... ,,	2 8 0
French and Brush Polish (do.) ... ... ,,	2 2 0

GLASS

	per ft. super s. d.
Delivered London area	
18 oz. Sheet Glass Ordinary Glazing Quality-Cut Sizes	7⅞
24 oz. ,, ,, ,, ,, ,, ,,	10⅝
26 oz. ,, ,, ,, ,, ,, ,,	1 0½
32 oz. ,, ,, ,, ,, ,, ,,	1 4½
⅛ in. Rolled Plate	11½
⅛ in. Rolled and Rough Cast	1 3
¼ in. ,, ,, ,, ,, ...	1 3¾

	per ft. super s. d.
⅛ in. Figured Rolled and Cathedral, Standard patterns : White Group 1	11½
do. Group 2	1 3½
do. Standard Tints	1 10
do. Special Tints	6 8
⅛ in. Pinstripe, Hammerstripe, Reeded, Reedlyte and Luminating Group 3	1 4½
¼ in. Wired Cast	1 7½
¼ in. Georgian Wired Cast...	1 7½
Hollow Glass Blocks—	Each
P.B.2. 5⅜ × 5⅜ × 3⅞ in.	3 3
P.B.3 7⅛ × 7⅛ × 3⅞ in.	5 0
P.B.32 7⅛ × 7⅛ × 3⅞ in.	5 0
Radiused Corner Blocks to match up with—	
P.B.2	6 0
P.B.3	7 6
P.B.32	7 6
¼ in. Polished Plate Glass, G.G. Quality—	Per ft. super
In plates not exceeding 2 ft. sup.	4 3
,, ,, ,, 5 ft. sup.	5 3
,, ,, ,, 45 ft. sup.	6 3
,, ,, ,, 100 ft. sup.	6 9
¼ in. Polished Plate, extra sizes, *i.e.*, plates exceeding 100 ft. sup. or 160 in. one way or 96 in. both ways. G.G. quality—Not exceeding 135 ft. sup. or 250 in. one way or 135 in. both ways	10 0
Not exceeding 180 ft. sup. or ditto	13 4
Plates exceeding 180 ft. sup. prices on application.	
Substances other than ¼ in. Polished Plate at Special Prices.	

Quantity Tariff—Sheet and Sundry Glass.

The following prices apply to minimum quantities of one size and one pattern delivered by the manufacturer to one site at one time.

Description of Glass	Minimum quantity	Per ft. sup. s. d.
18 oz. sheet O.Q.	3,000	5⅜
24 oz. ,, ,, ...	2,000	7⅛
26 oz. ,, ,, ...	2,000	9½
32 oz. ,, ,, ...	2,000	1 1½
⅛ in. Rolled Plate	1,000	8½
⅛ in. Figured Rolled and Cathedral Standard Patterns, White Group 1	1,000	8½
do. Group 2	1,000	10½
⅛ in. Pinstripe, Hammerstripe, Reeded, Luminating and Spotlyte Group 3	1,000	11⅞
7/32 in. and ¼ in. Rolled Plate or Rough Cast ...	2,000	1 0
¼ in. Wired Cast, Hexagonal	2,000	1 2
¼ in. Georgian Wired Cast	2,000	1 2½

The Builder

CURRENT RATES OF WAGES

AS FROM MAY 27, 1957. (Every endeavour is made to ensure accuracy but we cannot be responsible for errors.)

KEY TO SCHEDULE OF GRADE RATES.

Grade Classification.	A	A1
Craftsmen	4/6	4/5½
Labourers	3/11½	3/11

Town.	*Grade.*
Aberavon	A
Aberdare	A
Abergavenny	A
Abingdon	A1
Accrington	A
Addlestone	A
Afan Valley	A
Aldeburgh	A1
Aldershot District	A1
Alfreton UD	A
Alnwick UD	A
Altrincham	A
Amble	A
Ambleside	A1
Amersham	A
Ammanford	A
Andover	A1
Anglesey, Isle of	A1
Ardingly	A1
Arundel	A1
Ascot	A1
Ashbourne RD	A1
Ashbourne UD	A1
Ashby-de-la-Zouch UD	A
Ashby Woulds UD	A
Ashford (Kent)	A1
Ashford (Middlesex)	A
Ashington UD	A
Ashtead	A
Ashton-under-Lyne	A
Aspatria and Brayton	A1
Atherstone RD	A
Attleborough	A1
Axminster	A1
Aylesbury	A1
Aylsham	A1
Bagshot	A1
Bakewell UD	A1
Banbury	A1
Bangor	A1
Barnard Castle UD	A
Barnoldswick UD	A
Barnsley CB	A
Barnstaple	A1
Barrow-in-Furness	A
Barrow-upon-Soar RD (part Thrussington)	A1
Barry	A
Basford RD (exc. Willough-by-on-the-Wolds A1)	A
Basingstoke	A1
Bath	A
Batley MB	A
Baxterley	A1
Beaconsfield District	A
Bearl	A
Beccles	A1
Bedale RD	A
Bedford	A
Bedlington	A
Bedlingtonshire UD	A
Bedwas	A
Beeston & Stapleford UD	A
Belper UD	A
Belton	A
Berkhamsted	A
Berrington	A1
Berwick Borough	A
Beverley MB	A
Bewdley MB	A
Bexhill-on-Sea	A1
Bideford	A1
Biggleswade	A1
Billericay	A
Billing	A
Billingham UD	A
Bilsthorpe	A
Bilston MB	A
Birchington	A1
Birkenhead	*
Birmingham CB	†A
Bishop Auckland UD	A
Bishop's Stortford	A
Bishops Castle MB	A1
Bispham	A
Blackburn	A
Blackpool	A
Blackwell RD	A
Blandford	A1
Blaydon UD	A
Blidworth	A
Blyth B.	A
Bodmin	A1
Bognor Regis	A1
Boldon UD	A
Bolsover UD	A
Bolton	A
Boston MB	A
Bourne End	A
Bournemouth District	A
Brackley MB	A1
Bracknell	A1
Bradford CB	A
Bradford-on-Avon	A1
Braintree	A1
Brandon & Byshottles UD	A
Brecon—Borough of	A1
Breconshire, County of	‡A1
Brent Knoll	A1
Brentwood	A
Bridgend	A
Bridlington MB	A
Bridlington RD	A1
Bridgnorth MB	A1
Bridgnorth RD	A1
Bridgwater	A1
Brierfield	A
Brighouse MB	A
Brighton & Hove	A
Bristol District	A
Broadstairs	A1
Bromsgrove UD	A
Broughton, Flint	A
Buckfastleigh	A1
Buckingham	A1
Buckley	A
Bungay	A1
Burnham-on-Crouch	A1
Burnham-on-Sea	A1
Burnley	A
Burton-on-Trent C.B.	A
Bury	A
Bury St. Edmunds	A1
Buxton	A
Byfleet	A1
Caernarvon	A1
Caernarvonshire, Cnty. of	‡A1
Calder Valley	A
Camberley District	A1
Cambridge	A
Cannock UD	A
Canterbury	A1
Cardiff	A
Cardiganshire, County of	‡A1
Carlisle	A

CURRENT RATES OF WAGES—Continued

Town.	Grade.
Carlton UD	A
Carmarthen—Borough of	A1
Carmarthenshire,Cnty of	‡A1
Carnforth	A
Castleford UD	A
Caterham	A
Chapel-en-le-Frith	A
Chard	A1
Charmy Down	A
Chatham District	A
Chatteris	A1
Cheadle (Staffs) RD	A
Chelmsford	A
Cheltenham	A
Chepstow	A
Chertsey	A
Chester	A
Chester-le-Street UD	A
Chesterfield MB	A
Chesterfield RD	A
Chichester	A1
Chipping Norton	A1
Chipping Sodbury	A1
Chippenham (inc. Chippenham Within and Hardenhuish)	A1
Chorley	A
Cirencester	A1
Clacton	A1
Clay Cross UD	A
Cleethorpes MB	A
Clevedon	A1
Cleveleys	A
Clitheroe	A
Coalville UD	A
Cobham (Surrey)	A
Colchester	A
Colne	A
Colwyn Bay	A1
Congleton	A1
Consett UD	A
Conway	A1
Corby UD	A
Cornwall, County of	‡A1
Corsham District	A
Coventry CB	A
Cranbrook	A1
Cranleigh	A1
Cranwell Aerodrome Site	A
Crawley	A1
Crewe	A
Crewkerne	A1
Cromer	A1
Crook and Willington UD	A
Crowborough	A1
Cuckfield	A1
Cwmbran	A
Dalton-in-Furness	A
Darlington CB	A
Dartmouth	A1
Darwen	A
Daventry MB	A1
Deal	A1
Denbigh Town	A1
Derby CB	A
Devizes	A1
Devon, County of	‡A1
Dewsbury CB	A
Didcot	A1
Diss	A1
Doncaster CB	A
Dorchester	A1
Dorking	A
Dorset, County of	A1
Dover	A1
Dovercourt	A
Driffield UD	A1
Drigg & Carleton	A
Droitwich MB	A
Dudley CB	A
Dunstable	A
Durham B	A
Eastbourne	A
E. Glam. & Mon. Val.	A
East Grinstead District	A1
East Kesteven RD	A1
East Retford MB	A
Eastwood (Notts) UD	A
Ebbw Vale & District	A
Edenbridge	A1
Ely	A1
Epping	A
Evesham MB	A1
Exeter	A
Exmouth	A1
Fakenham	A1
Falmouth	A1
Fareham	A
Faversham	A1
Felixstowe	A1
Filey UD	A
Fleetwood	A
Flint MB	A
Folkestone	A1
Frinton	A1
Frome	A1
Gainsborough UD	A
Gateshead CB	A
Gillingham (Dorset)	A1
Gillingham (Kent)	A
Glastonbury & Street	A1
Glossop	A
Gloucester	A
Gloucestershire, Cnty. of	‡A1
Godalming	A1
Goole, MB	A
Goole RD (part—Airmyn, Hook)	A
Gosport	A
Grantham MB	A
Gravesend	A
Grays Thurrock UD Area	A
Great Yarmouth	A
Grimsby CB	A
Grimsby RD (part)	A1
Guildford District	A1
Halesowen MB	A
Halifax CB	A
Halstead	A1
Haresfield	A1
Harlow	A
Harpenden	A
Harrogate MB	A
Hartlepool B	A
Harwell	A1
Harwich	A
Haslemere	A1
Hastings	A1
Hatfield (Herts)	A
Havant	A
Haywards Heath	A1
Heanor UD	A
Hemel Hempstead	A
Henley-on-Thames	A1
Hereford	A1
Herefordshire, Cnty. of	‡A1
Herne Bay	A1
Hertford	A
Hexham RD	A
Hexham UD	A
Heysham	A
Heywood	A
Higham Ferrers MB	A
High Wycombe	A
Hinckley UD	A
Hitchin	A
Hoddesdon	A
Holywell	A
Horley	A1
Horncastle UD	A1
Horsham	A1
Horwich	A
Huddersfield CB	A
Hull	A
Hunstanton	A1
Huntington (Staffs)	A
Ilfracombe	A1
Ilkeston MB	A
Ilkley UD	A
Ipswich	A
Isle of Sheppey	A1
Isle of Thanet	A1
Isle of Wight	A1
Jarrow B	A
Keighley MB	A
Kendal	A
Kenilworth UD	A
Kettering MB	A
Keynsham	A
Kidderminster MB	A
Kingskerswell	A1
King's Lynn	A1
Kingsteignton	A1
Kirkham	A
Knaresborough UD	A
Knutsford	A
Lancaster	A
Leamington MB	A
Leatherhead	A
Leeds CB	A
Leek UD	A
Leicester CB	A
Leighton Buzzard	A1
Leiston	A1
Leominster	A1
Letchworth	A
Lewes	A1
Lichfield MB	A
Lincoln CB	A
Liskeard	A1
Littlehampton	A1
Liverpool	*
Llandudno	A1
Llanelly (incl. Llanelly RD)	A
Llanfairfechan	A1
Llangollen	A1
London	*
Long Eaton	A
Looe	A1
Loughborough MB	A
Louth MB	A1
Lowestoft	A
Loxton	A1
Ludlow MB	A1
Ludlow RD	A1
Luton	A
Lyme Regis	A1
Lyneham (Devon)	A1
Lytham	A
Macclesfield	A
Maidenhead	A
Maidstone	A
Maldon (Essex)	A1
Maltby UD	A
Malton UD	A1
Malvern UD	A
Manchester	A
Manningtree	A1
Mansfield MB	A
March	A1
Margate	A1
Market Harborough RD	A1
Market Harborough UD	A
Market Rasen UD	A1
Martock	A1
Maryport	A
Matlock UD	A
Melksham	A1
Melton Mowbray UD	A
Merionethshire	A1
Merthyr	A
Mexborough UD	A
Middlesbrough CB	A
Middleton	A
Middlewich	A
Mildenhall	A1
Milford Haven UD	A1
Minehead	A1
Monmouth—Borough of	A1
Monmouthshire	A1
Morecambe	A
Moreton Valence	A1
Morley	A
Morpeth B	A
Morpeth RD	A
Mundesley	A1
Nantwich	A
Neath & Valley	A
Nelson	A
Newark MB	A
Newbury	A1
Newcastle-on-Tyne CB	A
Newcastle-under-Lyme	A
New Forest District	A1
Newmarket	A1
Newport, Mon.	A
Newport Pagnell	A1
Newquay	A1
Newton Abbot	A1
Normanton UD	A
Northallerton District	A
Northallerton UD	A
Northampton CB	A
North Shields	A
North Walsham	A1
Northwich	A
Norton Radstock	A1
Norwich	A
Nottingham CB	A
Nuneaton MB	A
Oakham RD	A1
Oakham UD	A1
Okehampton	A1
Oldham	A
Ongar	A
Ormskirk	A
Ossett & Horbury	A
Oswestry	A1
Oundle UD	A1
Oxford	A
Oxted	A1
Padstow	A1
Paignton	A1
Par	A1
Pembrokeshire (except Milford Haven)	A1
Penmaenmawr	A1
Penrith UD	A1
Penzance	A1
Peterborough, Soke of (Eastern Regional portion)	A1
Petersfield	A1
Pickering	A1
Plymouth	A
Pontefract MB	A
Pontypool & District	A
Pontypridd District	A
Porthcawl	A
Portishead	A
Portland Bill	A1
Portsmouth	A
Port Talbot	A
Preston	A
Princetown	A1
Pudsey MB	A
Pulborough	A1
Radnorshire, County of	‡A1
Ramsgate	A1
Raunds UD	A
Rayleigh	A
Reading	A
Redcar B	A
Redditch UD	A
Redhill & Reigate	A
Rhondda Valley	A
Richmond B (Yorks)	A
Ripon MB	A1
Rochdale	A
Rochester	A
Ross-on-Wye	A1
Rossendale Valley	A
Rotherham CB	A
Royston	A1
Rugby MB	A
Rugeley UD	A1
Rushden UD	A
Saffron Walden	A1
St. Albans	A
St. Austell	A1
St. Helens	A
St. Neots	A1
Salisbury City	A1
Salisbury Plain	A1
Sandy	A1
Sawbridgeworth	A
Saxmundham	A1
Scarborough MB	A
Scunthorpe MB	A
Seaford & Newhaven	A1
Selby UD	A
Sevenoaks	A
Shaftesbury	A1
Sheerness	A1
Sheffield MB	A
Shepton Mallet	A1
Sherborne	A1
Shipley	A
Shoeburyness	A
Shoreham	A
Shrewsbury MB	A
Sirhowy Valleys	A
Sittingbourne	A1
Skegness UD	A1
Skipton UD	A
Sleaford UD	A1
Slough, Windsor & Eton District	A
Smethwick CB	†A
Snettisham	A1
Solihull UD	A
Somerset, County of	‡A1
Southampton and Eastleigh	A
Southend-on-Sea Dist.	A
Southport	A
South Shields CB	A
Southwold	A1
Spalding UD	A1
Stafford MB	A
Staines	A
Stamford MB	A
Stantonwick	A
Stevenage	A
Stockport	A
Stockton RD	A
Stockton-on-Tees B	A
Stoke-on-Trent CB	A
Stoke Orchard	A1
Stourbridge MB	A
Stourport UD	A
Stowmarket	A1
Stratford-on-Avon MB	A
Stroud (RD Area)	A1
Sunderland CB	A
Sunningdale	A1
Sutton Coldfield MB	A
Swadlincote UD	A
Swaffham	A1
Swanage District	A1
Swansea	A
Swindon District	A
Swinton UD	A
Tamworth MB	A
Taunton	A1
Tavistock	A1
Tenterden	A1
Teignmouth	A1
Tewkesbury	A1
Thames Haven	A
Thetford	A1
Thirsk RD	A
Thorpe Bay	A
Thurrock UDC Area	A
„ North of to Billericay	A
Tilbury	A
Todmorden MB	A
Tonbridge	A1
Torquay	A1
Totnes	A1
Tring	A1
Trowbridge	A1
Truro	A1
Tunbridge Wells	A1
Tynemouth CB	A
Ulverston	A
Uppingham (Salop)	A1
Uttoxeter RD	A1
Uttoxeter UD	A1
Wakefield CB	A
Wakefield RD	A
Walsall CB	A
Wallsend B	A
Walsden	A
Walton-on-Naze	A1
Ware	A
Warminster	A1
Warrington	A
Warwick MB	A
Wednesbury MB	A
Wellingborough UD	A
Wellington UD	A
Wellington (Somerset)	A1
Wells (Norfolk)	A1
Wells (Somerset)	A1
Welwyn	A
Welwyn Gar. City	A
West Bromwich CB	A
Westbury	A1
Westcliff-on-Sea	A
Westerham	A1
West Hartlepool CB	A
Westmorland (except Kendal)	A1
Weston-super-Mare	A1
Weybridge	A
Weymouth (including Portland Bill, excluding Portland Stoneyards)	A1
Whitby UD	A1
Whitby RD	A1
Whitehaven	A
Whitley & Monkseaton UD	A
Whitstable and District	A1
Wickford	A
Widnes	A
Wigan	A
Wigton	A
Wilmslow	A
Wilts. County of	‡A1
Wimborne	A1
Wincanton	A1
Winchester	A1
Windermere	A1
Wisbech	A1
Witham	A1
Withernsea UD	A1
Woking	A
Wokingham	A1
Wolverhampton CB	A
Wolverton District	A1
Woodbridge	A1
Woodhall Spa UD	A1
Woodstock	A1
Worcester CB	A
Workington	A
Worksop MB	A
Worthing	A1
Wrexham (incl. Cefn)	A
Wroughton	A1
Wylam	A
Wymondham	A1
Yate	A1
Yeovil Borough	A1
York CB	A
Ystalyfera	A

*For Birkenhead, Liverpool and London the rates are:—Craftsmen, 4s. 7½d.; Labourers, 4s. 1d. In the case of London the rate beyond the 12-mile radius is: Craftsmen, 4s. 7½d.; Labourers, 4s. 0½d. †Plus 2d. per working day. ‡This is the County rate and applies except where higher grades are stated.

NOTE.—Carpenters and Joiners providing own tools when employed in establishments operating under the Supplementary Rules for Woodworking Factories and Shops, receive 2d. per day; when employed on other building industry work, 4d. per day.

WOMEN'S RATES.—In all districts throughout the country the rate of wages for women engaged in craft processes is 3s. 7½d. per hour. Women engaged on work other than craft processes, 3s. 3½d. per hour.

For Building Trade Wages in Scotland see page 613

NEWS IN BRIEF

Liverpool Smokeless Zone

THE first confirmation of an order under the Clean Air Act, setting up a smoke control area, has been given by Mr. Henry Brooke, Minister of Housing and Local Government. It covers 100 acres in the centre of Liverpool. The area runs from George's Pierhead to Hatton Garden and Manchester-street. It is bounded on the north by Chapel-street and Tithebarn-street, and on the south by James-street, Lord-street and Whitechapel. The area comprises shops and offices, with a few houses and some Corporation buildings. The Order will come into operation on April 1 next. The Minister has also confirmed three further smokeless zone orders under the Manchester Corporation Act, 1946.

Wage Increase

Workers employed in the truck and ladder manufacturing industry have been awarded an increase of 1½d. per hour by the Industrial Disputes Tribunal.

Special Course

A special course of lectures on 'The Fundamental Theory of Matrices as Applied to Structural Analysis' has been arranged by the LCC Brixton School of Building on Tuesday evenings commencing on October 22.

Colour in the Home

The British Colour Council's exhibition of Town and Country Colours will open on Thursday, December 5, at 13, Portman-square, W1, and will continue until January 17. It will take the form of room sections of the home furnished and decorated with the Council's Town and Country Colours in carpets, fabrics, wallpapers, paint, pottery, china, glass, electrical fittings, etc., and should appeal to everyone with an interest in interior decoration.

Moving 60,000 Tons of Rock

An out-of-the-usual slate quarry blast took place on September 20 at the Broughton Moor Green Slate Quarries, near Coniston, Lancashire, when 60,000 tons of slate and rock were moved. The scene was televised—the first time quarry blasting has been seen on television. The value of the rock, which will be used to face some of Britain's new buildings, is estimated at £100,000.

Macclesfield Sites Offer

A brochure relating to the opportunities offered on the north-eastern industrial estate, Hurdsfield, to firms who wish to erect new factories, has been issued by Macclesfield Borough Council, who own the estate. The advantages offered to industry include the availability of 150 acres with all services, sites which may be purchased or leased, housing for key personnel, social amenities, etc.

Schools for South Yorkshire

The West Riding Education Committee meeting on September 24 agreed to build three steel-frame schools in the mining areas of South Yorkshire in a Ministry of Education pilot scheme. It is considered that these schools of a special type would safeguard authorities against subsidence and also effect considerable economies in school building costs. The County Architect is to attend a meeting early in October of the architects of the four or five authorities prepared to join in the scheme.

Coloured Aluminium

A paper on 'Architectural Colour Anodising' was presented by Mr. A. W. Brace and Mr. R. E. Polfreman, of Aluminium Laboratories, Limited, Banbury, to the Midland Branch of the Institute of Metal Finishing on October 1. The meeting was held at the James Watt Memorial Institute, Birmingham. The paper presented the result of seven years' research work in colour anodised aluminium for outdoor architectural work and a number of recent examples of coloured aluminium in building in various parts of the world were given.

Spastic Seals Competition

A luxury, four-bedroomed, freehold house valued at £3,695, has been given to the National Spastics Society as first prize in a nation-wide competition to raise money for its schools and centres. There are 600 other prizes including a yacht, a fully equipped modern kitchen and holidays in Europe. The NSS is holding the competition because it urgently needs £300,000 to pay the running costs of its centres next year. Every person buying two-and-a-half sheets of spastic Christmas seals is given a free entry in the 'Have A Go' competition. The Society's address is 28 Fitzroy-square, W1.

Street Furniture Design

The Minister of Transport and Civil Aviation has invited the Council of Industrial Design to add several new categories to the CoID list of approved street furniture designs. The Minister intends that new street furniture on trunk roads should comply with these approved designs as soon as this becomes practicable. The new categories will include passenger bus shelters, bollards, guard rails, litter and grit bins and other roadside furniture. Manufacturers of these products who wish to be represented on the new list—and architects, designers and authorities who have produced designs which could be made available to manufacturers—are invited to submit details to: Mr. Peter Whitworth, Secretary to the Street Furniture Panel, Council of Industrial Design, 28, Haymarket, SW1.

Sales Managers' Conference

The steps business managers can take now to 'minimise the threat and maximise the opportunities' which are implied in the European Free Trade Area proposals will be discussed at a one-day Conference in the Royal Festival Hall, London, on October 28. Promoters of the Conference are the Incorporated Sales Managers' Association. Speakers will focus attention on the facts, methods, techniques and attitudes which business managers will want to take note of in adjusting their policies to changes likely to come out of the Free Trade Area proposals. The Earl of Woolton, President of the Association, will preside at the Conference, and Mr. Reginald Maudling, MP, the Minister who supervises the Government's negotiations with our continental neighbours, will brief the Conference on the progress of negotiations. Mr. Leslie Gamage, MC, Chairman of the Export Trade Promotion Committee of the Federation of British Industries, will speak on the industrial and commercial implications of European Free Trade.

PAINTERS' PRESIDENT ON 'DIRTY LONDON'

'National Awakening Needed for Britain's Face-Lift'

A NATIONAL campaign to remove Britain's worst stigma abroad, 'the shame of unwashed St. Paul's Cathedral,' was called for by MR. S. J. BENGE-ABBOTT, president of the Federation of Painting Contractors' at the annual dinner held at the Dorchester Hotel, Park Lane, on September 30.

He demanded a national awakening to the need for an urgent country-wide face-lift 'to destroy the false picture hundreds of thousands of foreign visitors have of Britain, impoverished, in decline, on the way out.'

Mr. Benge-Abbott went on, 'I should be shirking my duty were I to deny the claims of our own country, claims that nobody else can possibly deal with as effectively as members of our Federation.' He then referred to 'the incredible squalor, the abysmal dirt, the depressing, degrading sights that greet us all every day of our lives. Dirty London is, I hold my head in humility, one of the dirtiest cities in the world. But we have been content to ignore the shameful picture that cries its evidence day by day to hundreds of thousands of foreign visitors, who come every year to Britain on holidays and on business.

'Is it not time somebody had the courage to point to the most squalid, most repelling building in London? Is it not time we all turned the finger of scorn, shame, and anger, at the gracious structure that has stood unwashed, uncleansed, a disgrace for nearly 300 years?'

Mr. Benge-Abbott called upon all organisations, professional and trade, to send messages to their Members of Parliament, to Mr. Duncan Sandys as the 'inspired and courageous head of the Civic Trust,' for early action over St. Paul's, concluding 'Let's have that clean.'

The president was replying to a toast 'The Painting and Decorating Trade,' proposed by Dr. Nathaniel Micklem, DD, LLD, MA, President of the Liberal Party. DR. MICKLEM, in the course of his speech, stated: 'I have been horrified to learn how great is the need of you. I was informed that over the borough of Southwark alone in any one winter month there falls 122 tons of soot and dirt, in every summer month the amount is 53 tons. What a destiny you have!'

On St. Paul's he said: 'You who are concerned with decorating and beautifying the outside of England must almost despair when you look at many of our buildings such as St. Paul's.'

The toast 'The Ladies and other Guests' was proposed by MR. GEORGE F. SIMPSON, FIBD, chairman of the Council of the Federation. MRS. BENGE-ABBOTT and MR. HAROLD CONOLLY, CBE, FRIBA, vice-president of the RIBA, responded.

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OVERSEAS BUILDING

From Our Own Correspondents

AUSTRALIA.—Tenders are to be called immediately for the construction of another major project in the big Snowy Mountains Hydro-Electric and Irrigation Scheme in south-eastern Australia. The new project is the T.2 power station in the Upper Tumut region, the third power station in the Scheme. This will include a concrete dam 150 feet high on the Tumut River, about two miles downstream from the T.1 power station. The T.2 station, due to begin production early in 1962, will have an output of 282,000 kW. It will provide work for more than 1,000 men for at least three years.

CEYLON.—It has been announced that Germany has offered the services of a Dr. Emerich to advise the Government on the conversion of the part of Trincomalee into a free industrial area.

CHINESE REPUBLIC.—Tientsin is following Shanghai's example and is moving its cemetery from the middle of the city to an outlying area in order to free land for Municipal development.

DENMARK.—Discussion took place recently between representatives of the Ministry for Greenland, Messrs. Oceatic Iron Ore of Canada, Ltd., and Messrs. Atlantic Iron Ores, Ltd., who propose to construct harbours for the trans-shipment of iron ore, at Rype Island, near Godthaab and at Marraq between Faeringehavn and Fiskenaes. . . . According to Press reports the Royal Greenland Trading Company will spend between Kr.60m. and Kr.70m. in the next six to seven years on new fishing plants at Jakobshavn, Holsteinborg, Godthaab Frederikshaab, and eventually at Egedsminde.

HONG KONG.—The proposal for a harbour bridge to link Hong Kong island with the mainland town of Kowloon has been taken a step further by a Government statement reserving for two years an area of land at Morrison Hill, Hong Kong, 'so that any scheme with an island terminal in this area does not become impracticable due to lack of land.' The Hydraulic Research Laboratory in the UK are to undertake a hydrographic survey of the harbour and Messrs. Scott & Wilson, Kirkpatrick & Partners, of London, are to be appointed consulting engineers for the project by a Hong Kong firm, the Harriman Realty Co., who are promoting the development.

JAPAN.—Construction of a double deck under-sea motorway linking the Island of Kyushu with the mainland of Japan is to be resumed after a wartime interruption. This tunnel, just over two miles in length, is estimated to cost £5,500,000 and will handle about 1,250,000 vehicles per year with about 2½ million passengers. The Japanese Highway Corporation are responsible for the work.

KOREA.—The United Nations Korean Reconstruction Agency is to build a motor repair depot and spare parts factory at Young Dong-Po, near Seoul, at an estimated cost of $500,000 (US). The building will be of steel frame construction insulated with fibreglass on roof and walls, and is expected to be the fore-runner of several other projects in the development of Korea's motor industry.

INDONESIA.—The Prime Minister has announced that an iron and steel industry is being set up in Indonesia and operations would start in 1958. Technical surveys are now being completed by the State Planning Bureau.

MALAYA.—Faced with a serious housing shortage, the Federation is finding it difficult to get contractors with sufficient financial means and ability to tackle large housing projects, says a report for 1956 of the Federal Housing Trust. There has been a noticeable drop in the number of tenders received in respect of individual projects, due perhaps to the high standard of construction insisted upon by the trust, the report states. In places like Alor Star and Kuala Trengganu, tenders were up to 100 per cent. above prices quoted for similar houses in the Kuala Lumpur area. Consequently, the trust was now investigating the possibility of 'do-it-yourself' or 'self-help' schemes whereby people would erect their own houses, guided by the trust's technical staff. . . . Tenders have been invited by the architect of the Central Electricity Board, Kuala Lumpur, Federation of Malaya, for the construction of 85 junior officers' quarters at Tanjong Kling, Malacca. . . . A new £100,000 oil terminal and storage depot is to be built at Tanjong Kling, Malacca, by the Standard Vacuum Oil Company of New York. The project, it is understood, will embrace six tanks with a total capacity of 1,800,000 gallons. The terminal—the ninth to be built by the company in the Federation—will give better distribution to Malacca and surrounding areas. . . . A new palace, to cost about £300,000, is to be built at Klang for the Sultan of Selangor, Federation of Malaya, on the site of a palace which is to be demolished, unless protests against the demolition have any result. There is a move to try to keep the old palace as a national monument. The new palace will have a throne room to hold 300 people, a two-deck banquet hall, a conference room, and separate prayer rooms for men and women.

PORTUGUESE WEST AFRICA.—The Government was authorised recently to open a special credit for the Cunene Valley Development scheme. This is to be used among other things for irrigation, hydro-electric exploitation of the Matala barrage, continuation of the Mocamedes Railway and completion of the bridge over the Cunene. . . . The Empresa Comercial do Ultramar has sought permission to erect a ceramics factory in Luanda — the Sociedade Industrial e Comercial de Construcoes in planning a soluble coffee factory also in Luanda, and authority has been granted for another ceramics factory in the district of Huambo. According to Press reports a plan is being considered in Lisbon for the erection in Angola of a factory for the production of electrical cables, wire, switches, etc.

SINGAPORE.—Tenders have been invited by the Architectural Department of the Singapore Improvement Trust for the erection and completion of four blocks of nine-storey flats, four blocks of four-storey and seven-storey flats, and electrical sub-station at St. Michael's-road. . . . The Shell company plans to set up a blending, packing and oil bulking plant in Singapore, to cater for Malaya, as well as the export trade, said the Singapore Ministry of Commerce and Industry. Some £350,000 would be invested by the company in this project. . . . Mr. F. Pelton, the Singapore Government's drainage adviser, said recently that the £230,000 scheme to end flooding in the Geylang Serai-Paya Lebar area was being pushed ahead as rapidly as possible. It involved the building of two massive tidal control gates on two major channels discharging into the Kallang Basin and the Geyland River estuary. Funds had been allocated for next year to finish this scheme and to start work on the £350,000 Singapore River and Sungei Ulu Pandan project to eliminate flooding in the Queenstown region. Under the present list of priorities the Bukit Timah and Stamford Canal scheme came next; estimated cost of this is about £1m. It is unlikely to be started before 1959.

THAILAND.—The Thai National Assembly in Bangkok has approved the expenditure of US $100m. on a dam and hydro-electric scheme at Yarnhee in North East Thailand. The scheme to be named Phumiphol after the King of Thailand, will produce 560,000 Kilowatts and serve 36 of the country's 71 provinces. Two-thirds of the estimated cost will be provided by the World Bank. . . . Representatives of South Vietnam, Cambodia, Laus and Thailand have met in Bangkok to discuss a United Nations sponsored project costing $200m. for a hydro-electric scheme on the Lower Mekong River to benefit all four countries.

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Lagos Report

The Lagos Executive Development Board have issued their Annual Report for 1956-57 in which they indicate the scope of their activities. In planning control 3,000 applications were handled and a new method of

development control introduced in Surulere.

Slum clearance in the centre of Lagos was effectively operated and 3,000 persons removed, nearly 200 premises demolished, and redevelopment of streets and premises commenced.

The report also states that good progress was made on schemes involving 2,300 houses. The value of development projects in hand was £9m.

Well illustrated, the report gives details of the various schemes being undertaken and there are sections on estate management, public relations, labour and finance.

Dollar Exports Council Delegation

The Dollar Exports Council announces that, following the visit of a delegation to Eastern Canada last spring to investigate the prospects for increased exports from the UK, primarily in the constructional and allied fields, and to pave the way for personal visits by the heads of British manufacturing companies, arrangements have now been made for a similar delegation to visit Western Canada in October.

Mr. Halford Reddish, chairman and managing director of The Rugby Portland Cement Co., Ltd., who led the earlier delegation, will again head the delegation and will be accompanied by Mr. J. W. Whiter, managing director of Richard Costain Limited. Mr. F. Davies, of the North American Department of the Federation of British Industries, will again act as secretary. The delegation will visit Vancouver, Victoria, Edmonton and Winnipeg.

UK COMMERCIAL EXHIBITION, RANGOON

From Our Own Correspondent

It is proposed by the Board of Trade, in conjunction with the Rangoon Chamber of Commerce, to hold a Commercial Exhibition of British products (including building materials and plant) in Rangoon in March, 1959. The duration of the exhibition is intended to be about eight days. This exhibition is intended as a counter to the successful displays made in SE Asia of German and Russian products, the Japanese 'floating fair,' etc. The representative of the Board of Trade who visited Rangoon recently suggested that if the use of one or other of the assembly halls could be obtained, the exhibition should be held for first choice in the new Technical High School (opposite the Royal Lakes), or for second choice in the new Engineering College, Prome-road, Rangoon. Both these projects, which are now complete, were commenced in 1954 and were constructed by Taylor Woodrow Construction, Ltd. (architects: Raglan Squire and Partners).

If either of these intended locations is used it could probably be turned to good advantage by the many British suppliers whose materials were used on these two schemes, by making reference in their displays to the practical application of their products in the exhibition building.

Position Regarding 'Spares'

Much British plant in use by local contractors is being allowed to become a 'write-off' on account of ignorance of the availability of spares. It would seem an excellent opportunity for plant suppliers to rectify this defect of knowledge, as it is giving their plant a completely undeserved bad reputation. Standard Burmese practice at the moment is to cannibalise existing good equipment when in need of spares. Education on the poor financial effect of such procedure is sadly needed, however elementary such common sense might appear to European eyes.

Exhibits will be selected in consultation with the Government of the Union of Burma in order to accord with the requirements of their new four-year development plan. It is understood that the Board of Trade intends to provide an exhibit illustrating the atomic energy programme.

Further information can be obtained from Mr. J. G. Taylor, British Embassy, 80, Strand-road, Rangoon.

Further Exhibitions Proposed

It is believed that similar exhibitions are intended, as follows:—

Singapore (Raffles Institution) August, 1958.

Kuala Lumpur (Chin Wu Stadium. or possibly as part of an international exhibition at Petaling Jaya), September, 1958.

Saigon (site not decided), December, 1958.

Bangkok (Lumpini Hall), February, 1959.

Further information regarding these other exhibitions in SE Asia could, it is suggested, be obtained from the Board of Trade, Export Services Branch, Lacon House, Theobald's-road, London, WC1.

The Chapel, Gatton Park

Ragusa Asphalte Paving Co. Ltd., Tredegar-road, Old Ford, E3, inform us that the flat roofing on the Chapel, Gatton Park, Surrey (illustrated on September 20) was carried out by them, using 'Ragusite' built-up felt roofing.

Reports issued by the Central Council for the care of Churches

Church Timberwork, Books & Fabrics: Damage and Repair
(Price 2s.6d.; post paid 2s.10d.)

Church Roof Coverings
(Price 2s.3d.; post paid 2s.7d.)

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The Builder House,
Catherine-street,
Aldwych, W.C.2

The SCOTTISH BUILDER

Pollokshaws Redevelopment Plan

GLASGOW Corporation are considering proposals for the redevelopment of the Pollokshaws area of the city. As a first step the Corporation have received the Secretary of State's approval to the change of zoning from industrial to residential in the development plan of an area of 6.4 acres partly occupied by Macdonalds of Pollokshaws and Compressors Ltd., both of whom sought planning authority from the Corporation for extensions to their premises, and were refused.

After an inquiry into the objections lodged by these firms the Secretary of State has decided that the Corporation's proposal to change the zoning is desirable in the public interest. The land would in his view be an essential part of the re-developed area and if retained for industrial use there would be a loss of housing for 1,000 people.

NEW BUILDINGS

Aberdeen.—Scottish Education Department approved £69.819 extension scheme at Robert Gordon's College; also extension at Robert Gordon's Technical College.

Arbroath.—Dean of Guild Court have granted the TC permission to build 60 houses at a cost of £71,700.

Arbroath.—Dean of Guild Court have approved a TC plan to build 30 two-apt. and 30 three-apt. flats at Glenogil-ter. Est. cost £71,700.

Arbroath.—Plans approved by Angus CC for alteration of premises at Hill-st. for use as dental and orthopaedic clinic.

Inverness.—Dean of Guild Court approved extensions to Technical High sch. Est. cost £91,160.

Middlemills (Midlothian).—(a) Storm water tanks in rc; (b) short lengths of sewer in steel and concrete pipes; (c) pumphouse and store; (d) access road to site. Applications to Messrs. Partridge, Earp & Ptnrs., 18, Great King-st., Edinburgh 3, by October 3. Dep. £5 5s.

North of Scotland Hydro Electric Board.—Constructional Scheme No. 47—Storr Lochs Additions Project—two aqueducts, line or lines of pipes, in Portree, Skye. Moriston Additions project, an aqueduct and three reservoirs in Urquart and Glenmoriston. Details from Head Office, 16, Rothesay-ter., Edinburgh 3.

SCOTTISH BUILDING TRADE WAGES

FOLLOWING are rates of wages authorised by the Scottish National Joint Council as from May 27, 1957. They apply to the whole of Scotland, including the islands of Orkney, Shetland, etc.

Grade A: Craftsmen 4s. 6d.; Labourers 3s. 11½d.

For apprentices, the rates are:

Year.	Percentage of Craftsman's rate.	For week of 44 hours
		s. d.
1st	25	49 6
2nd	33⅓	66 0
3rd	50	99 0
4th	66⅔	132 0
5th	75	148 6

For female labour, the rates are:

	s. d.
Operatives on craft operations (at end of probationary period)	3 11½
Operatives on labouring operations (at end of probationary period)	3 5½

The Builder

FUTURE CONSTRUCTION

Full details of Public Appointments open will be found in the Advertisement pages of this and previous issues.

CONTRACTS OPEN

For some contracts still open but not included in this list see previous issues. Those with an asterisk are advertised in this number. The dates at the heads of paragraphs are those for the submission of tenders; a dagger (†) denotes closing date for applications; the name and address at the end refer to the person from whom particulars may be obtained.

BUILDING

OCTOBER 7.

***†Gravesend BC.**—72 maisonettes and 32 flats at Park-place. BE&S, 6, Woodville-terr. Dep. £2 2s. Tenders by November 18.

***†Smethwick CB.**—Erection of Health Centre, Holly-la. BE&S. Dep. £2 2s. Tenders by Oct. 30.

***†Surbiton BC.**—28 old people's dwellings at Berrylands-rd. TC.

OCTOBER 8.

***Rugby BC.**—Bathroom improvements to 34 houses. BS.

OCTOBER 10.

***†Birmingham City C.**—Blocks of eight-storey flats at Bushwood-rd., Weoley Castle and other sites. City A.

***†Blackburn CB.**—Extensions to Blackamoor open air sch. BE. Dep. £2 2s.

OCTOBER 12.

***†Cornwall CC.**—Erection of County jun. sch. at St. Columb Minor, Newquay. County A. Dep. £5 5s. Tenders by Nov. 7.

OCTOBER 14.

†Breconshire CC.—Additional classroom accommodation at Crickhowell sec. mod. sch. County A.

***†Southampton CB.**—19 houses at Millbrook estate, contract B.216. BE.

***†Wolverhampton CB.**—District fire station, Bushbury-rd. BE. Dep. £2 2s.

OCTOBER 15.

Eastleigh BC.—23 pairs of three-bedroom houses and seven blocks of four two-bedroom houses, boundary walls, paths, outhouses, etc., at Velmac housing estate. Boro' E&S. Dep. £2 2s.

OCTOBER 17.

Liverpool City C.—1,281 dwellings at Childwell Valley estate. City A and Director of Housing. Dep. £2 2s.

OCTOBER 18.

***†North Riding CC.**—Fire station and ambulance offices at Guisborough. County A. Dep. £2 2s.

OCTOBER 21.

***Richmond (Surrey) BC.**—Repair and decoration of Twickenham-rd. public conveniences. BE.

OCTOBER 23.

***Harrow BC.**—Repair and modernisation of sanitary block at Harrow county boys' sec. grammar sch. BE. Dep. £2.

***Southport CB.**—Supply and erection of W.C. cubicles at girls' high sch., Hillside. Boro' A and Town Planning Officer, 99/105, Lord-st. Dep. £1 1s.

OCTOBER 25.

***Sunderland CB.**—84 dwellings at Hylton Castle estate (Phase II). Boro' A, Grange House. Dep. £2 2s.

OCTOBER 30.

***Esher UDC.**—10 dwellings at Bankside-dr., Hinchley Wood, contract No. 243. E&S. Dep. £2 2s.

NOVEMBER 1.

***Ealing BC.**—24 flats Northolt and 122 flats and maisonettes, Northolt Park estate. BS. Dep. £2.

NO DATE.

***Portchester Crematorium Joint Committee.**—Supervisor's and caretaker's houses. Engineer to the Crematorium Joint Committee, Town Hall, Gosport. Dep. £2.

PAINTING, MATERIALS, ETC.

OCTOBER 19.

***Southport CB.**—Electrical installation; hot water heating installation; supply and installation of gas fired cremators and air blowing fans; supply and installation of electrically driven pulveriser; supply and delivery of steel roof trusses for crematorium at Scarisbrick. Boro' A and Town Planning Officer, 99/105, Lord-st. Dep. £1 1s. each contract.

OCTOBER 22.

Taunton BC.—Building and road materials. TC.

OCTOBER 24.

Chingford BC.—Road materials. Boro' E. (Chingford).

MUNICIPAL AND CIVIL ENGINEERING WORKS, ETC.

OCTOBER 16.

Newcastle Emlyn RDC.—2,730 yd. of 6 in. and 9 in. dia. concrete tubes and 897 yd. of 9 in. and 4 in. dia. spun-iron pipes with manholes, pumping station, etc., at Cwmanne, nr. Lampeter, Carmarthenshire. J. Owen Parry & Lewis, Ccl's. constg. engrs., Ammanford, Carms. Dep. £5 5s.

Newtown and Llanidloes RDC.—2,212 yd. of 3 in. dia. spun-iron water mains with screw gland joints and assist in erection of extension to elevated pressed steel tank at Adfa, 12 miles NE of Newtown. W. Herbert Bateman & Ptnrs., constg. engrs., 1, Chapel-row, Bath. Dep. £3 3s.

OCTOBER 17.

Leominster BC.—1,112 lin. yd. of 3 in. dia. asbestos-cement water main, etc. Boro' S. Dep. £2 2s.

OCTOBER 18.

Bedfordshire CC.—Widening and diversion of 1,200 lin. yd. of Route A.14 between Manor Farm and Reddings Wood. County S. Dep. £2.

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OCTOBER 21.

Angus CC.—3,500 lin. yd. of 6 in. dia. FC pipes with precast concrete manholes and r.c. pumping station. County E.

Walsingham RDC.—Sewage disposal works for Fakenham, reconstruction of one pumping station; 9 in. dia. CI rising main, etc., at Fakenham. A. P. I. Cottrell & Son, engrs., 54, Victoria-st., SW1, and 18, St. Nicholas-st., Diss. Dep. £3 3s.

OCTOBER 22.

Abram UDC.—2,040 lin. yd. of 6 in. to 3 in. CI water main with valves and fittings in Bickershaw-la. and Gibson-st. E&S. Dep. £2 2s.

OCTOBER 25.

Huddersfield CBC.—3,020 lin. yd. of earthenware, reinforced and unreinforced concrete pipes, 12 in. to 48 in. dia. in Lindley and Marsh relief sewers. Boro' E&S. Dep. £10 10s.

St. Neots RDC.—2,200 yd. of 9 in. and 6 in. dia. glazed stoneware sewers with manholes at Buckden. Pick, Everard, Keay & Gimson, Ccl's. constg. engrs., 6, Millstone-la., Leicester. Dep. £3 3s.

OCTOBER 26.

Luton RDC.—2,000 yd. of 3 in. AC water mains, Wellhead, Eaton Bray. E&S. Dep. £2 2s.

Oakham RDC.—5,500 yd. of 9 in. and 6 in. dia. sewers, 1,400 yd. of 5 in. dia. spun-iron pumping main, sewage pumping station and extensions to sewage disposal works in parishes of Cottesmore and Greetham, Rutland. Pick, Everard, Keay & Gimson, engrs., 6, Millstone-la., Leicester. Dep. £5 5s.

OCTOBER 28.

Pontypool UDC.—1,600 lin. yd. of 8 in. dia. spun-iron pumping main, one pumping station, one balancing tank, etc. John Taylor & Sons, engrs., Artillery-hse., Artillery-row, Victoria-st., SW1. Dep. £5.

St. Neots UDC.—3,500 yd. of 12 in. and 9 in. dia. spun-iron water mains with valves and valve pits, etc. John Taylor & Sons, engrs., Artillery-hse., Artillery-row, Victoria-st., SW1. Dep. £5.

York City C.—*Contract No. 15:* Twin 14 in. dia. spun-iron sewage rising mains each 595 yd. long; 15 in. dia. concrete sewer, 502 yd. long; 18 in. dia. concrete sewer 173 yd. long, manholes, etc.—*Contract No. 16:* 21 in. dia. concrete sewer, 1,258 yd. long; 21 in. dia. CI pipe sewer, 40 yd. long, etc. City E&S. Dep. £5.

OCTOBER 30.

Alton RDC.—9,724 lin. yd. of 9 in., 7 in. and 6 in. dia. glazed stoneware pipe sewers, concrete tube manholes, two sewage pumping stations, 570 lin. yd. of 5 in. dia. spun-iron rising mains, etc. in Grayshott parish. Willcox Raikes & Marshall, engrs., 33, Great Charles-st., Birmingham, 3. Dep. £5 5s.

NOVEMBER 4.

Salisbury and Wilton RDC.—2½ miles of 6 in. to 15 in. dia. sewers in concrete, stoneware and spun-iron pipes, with precast concrete manholes, laterals, pumping stations, full sewage treatment works, etc., at Downton, nr. Salisbury. C. Dep. £5 5s.

NOVEMBER 5.

Sandown-Shanklin UDC.—6,800 yd. of 15 in. to 48 in. dia. concrete pipe sewer, with manholes, 260 yd. of CI sea outfall pipe, 450 yd. of 8 in. dia. spun-iron pumping main, screen house and pumping stations, four settlement tanks, 12 sludge beds, with roads, fencing, etc. John Taylor & Sons, engrs., Artillery-hse., Artillery-row, Victoria-st., SW1. Dep. £5.

NOVEMBER 7.

Abingdon BC.—1,200 lin. yd. of estate roads and footpaths and 1,050 lin. yd. of 12 in. and 9 in. SW sewer at South-ave. estate. Boro' E&S. Dep. £3 3s.

NOVEMBER 12.

Wellington (Somt.) RDC.—14½ miles of 6 in. to 3 in. dia. spun-iron and asbestos-cement pipes and two mass-concrete reservoirs of 250,000 and 50,000 gallons capacity respectively, etc. Harvey, McGill & Hayes, Ccl's. constg. engrs., 8, Richmond-rd., Exeter. Dep. £5 5s.

NOVEMBER 25.

Eton RDC.—9 miles of 12 in., 9 in. and 6 in. dia. concrete and stoneware pipe sewers with stoneware laterals at Farnham Royal. E&S. Windsor-rd., Slough. Dep. £10 10s.

JANUARY 1, 1958.

Min'stry of Transport and Civil Aviation.—ADVANCE NOTICE.—London-Yorkshire motorway, South of Luton-Watford Gap-Dunchurch. *Length:* 12 to 16 miles. *Bulk excavation:* 2½

million yd. cubic. *Road surfacing:* 600,000 yd. super. *Concrete:* 15 road, rail and river bridges and 15 access bridges will require 75,000 cu. yd. *Reinforcing steel:* 3,000 tons (half pre-ordered). *Alterations to existing roads with services:* 15. Sir Owen Williams & Ptnrs., Minister's constg. engrs., 101, Wigmore-st., W1.

Hertfordshire CC.—ADVANCE NOTICE.—St. Albans Bypass motorway, South of Luton, South of St. Albans. *Length:* 12 miles. *Bulk excavation:* 1,900,000 cu. yd. *Carriageway works:* 600,000 super yd. *Concrete:* 23 road, rail and river bridges and four access bridges, requiring 70,000 cu. yd. *Reinforcing steel:* 4,500 tons (half pre-ordered). County S.

GENERAL BUILDING WORK

(LONDON)

Bermondsey.—APPOINTMENT.—The Housing, Town Planning and Estates Com. recommends that, upon the dissolution of the partnership of Messrs. Clifford Culpin & Ptnrs., Mr. W. W. Ryder (A), AMTPI, shall act as architect for the work in respect of which the Council had entered into agreements under the partnership.

Bermondsey.—FLATS AND GARAGES.—The LCC Housing Com. has approved a scheme for the development of two sites, together 2.3 acres in extent, on the northern side of Rotherhithe New-rd., by two sixteen-storey blocks each of 96 flats. On the western site, at the junction with Hawkstone-rd., six garages will be provided, and on the eastern site, at the junction with Rotherhithe Old-rd., there will be 12 garages. Each block will be provided with electric floor heating and two lifts. The estimated cost of the scheme is £561,900.

Croydon.—OLD PEOPLE'S HOSTELS.—After preliminary discussions with the MH & LG, the Welfare Com. recommends that a three-storey hostel for 59 residents, with quarters for three resident staff, should be erected at the Ashburton housing estate at an estimated cost of £61,600. A preliminary scheme has also been prepared for the adaptation and extension of Norbury Hall to provide accommodation for 40 residents and three staff at a cost of £35,00. If approved, this proposal would supersede that for a purpose-built hostel at Totton-rd. The Boro' Engineer is A. F. Holt, AMICE.

Finsbury. — MAISONETTES, FACTORIES AND GARAGES.—The LCC Housing Com. has approved proposals for developing two small sites totalling 0.8 acre, adjoining Wenlock estate by a five-storey block fronting on to Old-st. and containing accommodation for light industrial firms displaced by redevelopment schemes, together with 17 tenants' stores and a covered playground on the ground floor, with 20 maisonettes above. Five garages will also be provided on the site. On the northern site, fronting Mitchell-st., a five-storey block of 20 maisonettes and nine tenants' stores will be provided. The estimated cost is £121,400.

Greenwich. — APPOINTMENT. — The Housing Com. recommends the appointment of White & Hayton, 38-39, Parliament-st., SW1, as quantity surveyors for a scheme for the erection of two two-storey blocks comprising eight bed-sitting room flats at Dutton-st., adjoining the Council's Blackheath Hill housing estate.

Hackney.—FLATS.—The Housing and T.P. Com. has approved a scheme for the redevelopment of the island site bounded by Ashenden-rd., Daubeney-rd., Meeson-st. and Trehurst-st. by three three-storey blocks of flats, disposed on three sides of a rectangle, containing 12 three-bedroom, 18 two-bedroom and six bed-sitting room flats estimated to cost £84,400. The Boro' E&S and Director of Housing is G. L. A. Downing, OBE, MICE.

Lewisham.—HOUSES AND GARAGES.—The Housing Com. has approved layout plans for the redevelopment of the sites of 33-53 (odd) and 44-56 (even), Fermor-rd., by eight houses and three garages and five houses respectively. The Boro' Architect is M. H. Forward (F).

Lewisham.—MAISONETTES AND GARAGES.—The Housing Com. has approved layout plans for the redevelopment of the sites of 22-27 (cons.), Wynell-rd. by 12 maisonettes in one four-storey block and four garages.

Lewisham.—HOUSES AND GARAGES.—The Housing Com. has approved layout plans for the redevelopment of the sites of 48-58 (even), Hurstbourne-rd. by eight houses and three garages.

Lewisham. — FLATS AND GARAGES. — The Housing Com. has approved layout plans for the redevelopment of the sites of 75-111 (odd), Elsmore-rd. by two three-storey blocks of 24 flats and six garages.

Lewisham. — FLATS, MAISONETTES AND GARAGES.—The Housing Com. has approved layout and detailed plans for the development of the Paragon-place extension site by 24 flats and maisonettes in three-storey blocks and eight garages.

Lewisham.—MAISONETTES, BUNGALOWS AND GARAGES.—The Housing Com. proposes the redevelopment of two housing sites belonging to the City Corporation as Trustees of the Bridge House Estates and which it is proposed to take on lease from the Corporation, viz., 1.84 acres on the south side of Adelaide-ave. at the junction with Brockley-rd. and 0.91 acre to the north side of Adelaide-ave (1-19 odd). Layout and detailed plans for four four-storey blocks containing 56 maisonettes, two single-storey blocks containing eight bungalows, 13 garages, 16 perambulator stores and three cycle stores have been approved by the MH&LG and the LCC.

Lewisham. — MAISONETTES, HOUSES AND GARAGES.—The Housing Com. has approved detailed plans for the development of the sites of 243 (part), 247, 251 and 255, Baring-rd. (adjoining properties) by 88 maisonettes, 15 houses and 18 garages. The Boro' Architect is M. H. Forward (F).

St. Mary'ebone.—OFFICES.—Conditional planning permission has been given for the redevelopment of the sites of 15-17, Marylebone-rd. and 1, 2 and 3, Devonshire-terr. by a block of offices, partly of six- and partly of seven-storey construction for John Laing & Son, Ltd., who have agreed to include in the scheme a separate wing containing 16 new studios to replace the existing rehearsal studios at 1, Devonshire-terr. The architect is Clifford Culpin (F), 39, Doughty-st., WC1.

BUILDING WAGES

Regrading of Districts

THE National Joint Council for the Building Industry has authorised the following regradings to take effect on and from Monday, October 7 next:

MIDLANDS REGION, from A1 to A: Alcester RD (part) Sambourn and Studley; Malvern UD; Melton Mowbray UD; Stamford MB; Stone RD (part), Eccleshall (part), Chebsey (part), Sandon (part), Stone R. (part); and Tamworth RD (part), Amington, Austrey, Bolehill and Glascote, Kingsbury, Newton Regis, Seckington, Shuttington.

SOUTHERN COUNTIES REGION, from A1 to A: Amersham RD and Chesham UD, excluding those portions within Beaconsfield and Bourne End grading districts.

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(PROVINCIAL)

Amble, Northumberland.—UDC A to prepare plans for further houses and bungalows.

Amersham, Bucks.—LCC approved scheme of extensions to Rayners boarding sch. for deaf children, Penn, £98,390 est. A: Stillman & Eastwick-Field (A/A), 30, John-st., Bedford-row, WC1.

Billingham.—Durham County EC has approved plans for five schools for 2,500. County A, Durham.

Birkenhead.—BC to prepare plans for further houses at Neighbourhood Unit No. 8. Plans proposed:—Six houses at Beresford-rd. for Johnson Bros. A: A. Stanley Barnes (F), 7, Hamilton-sq., Birkenhead; extensions to factory at Vine-st. and Brook-st. for the Fusion Welding and Construction Co. (Birkenhead), Ltd.; alterations and extensions to property at Grange-rd. West to form theatre and construction of two shops for Birkenhead Repertory Theatre, Ltd.; potato crisp factory at Price-st. and Duke-st. for Crispa Crisps, Ltd. A: A. Stanley Barnes (F); 18 houses and garages at Meadway, Upton, for E. N. Davies & Son.

Border, Cumberland.—A for proposed large factory at Dalston for Nestlé Co., Hayes, Middlesex, is Hammond J. Harvey (F), 8, King-st., Hammersmith, W6.

Bradford.—New premises proposed at junction of Broadway and Charles-st. for C. & A. Modes, Ltd. A: North & Ptnrs. (F/L), 40, Broadway, Maidenhead, Berks.

Carlisle.—Plans submitted to TC.—Shop and flats at corner of Etterby-st. and Etterby Lea-rd. for Border Engineering Contractors, Ltd., Whitehaven; extensions to offices at Durranhill estate for W. Gibson & Son; new offices at English Damside for Eden Construction Co., Ltd.; extension to bakery at Durranhill estate for W. C. Robertson (Carlisle), Ltd. A: Johnston & Wright (L/A/A), 13, Castle-st.

Cheadle and Gatley.—UDC to seek site and prepare estimates for new swimming baths.

Cheadle, Staffs.—RDC approved plans for extensions to Checkley CP sch., Tean.

Chester.—E. C. L. Jones-Lloyd, Plas Newton, proposes development of 90-acre site in Newton and Upton districts. Inquiry held.

Chorley.—TC seeks loan £119,348 for erection of 38 houses, eight flats and 43 houses at Cowling estate; propose adaptation of Old Rectory to form aged persons' home.

Clay Cross.—Plans submitted to UDC:—Two single-storey factories at Derby-rd. for J. Adlington, Ltd.; shop at Bestwood-dr. for S. Chambers; new store at The Broadleys for J. H. White & Co.

Coventry.—City A to negotiate with George Wimpey & Co., Ltd., for six shops with three-bedroom maisonettes over, and for 267 one- and two-person flats, 163 four-person maisonettes and flats, and 181 five-person houses at Willenhall Wood site.

Dalton-in-Furness.—UDC proposes erection of aged persons' bungalows on two sites at Beckside-rd.

Derbyshire.—East Midlands Gas Board seeks site of 50/70 acres for erection of large new gasworks.

Dewsbury.—BC approved layout for 122 dwellings at Foxroyd-la. site, 72 dwellings at Spen Valley-rd. site, and layout for Daw Green Redevelopment Area, Scheme 2.—West Riding CC proposes erection of five police houses at Morlands-rd.

Durham.—New service centre is proposed for Northern Electricity Bd., Newcastle, £20,000 est. A: L. J. Couves & Ptnrs. (F/F), Carliol-hse., Newcastle.

Guisborough.—UDC has been asked by Imperial Chemical Industries, Ltd., to build 200 houses a year, for five years, for their employees, twice as many as previously suggested. Ccl's. A: P. R. Middleton (A/A), 17, Albert-rd., Middlesbrough.

Hebburn.—R. T. James & Ptnrs, Claveringpl., Newcastle-on-Tyne, are constg. engrs. for proposed reorganisation at shipyard of Hawthorn Leslie, Ltd.

Jarrow.—30 houses proposed for Wilkinson Bros., Gateshead. A: G. C. Young, Grange-rd. West, Jarrow.

Leek.—UDC approved layout for 26 bungalows at Belle Vue-rd.

Lytham St. Annes.—RC Authorities to erect new sec. sch. of St. Peters. A: Charles E. Jackson, 73, Harrington-ave.

Macclesfield.—TC received Ministry approval for slum clearance scheme at Turnock-st. area.

Malton.—New offices proposed for Northern Electricity Bd., Newcastle. A: J. Couves & Ptnrs. (F/F), Carliol-hse., Newcastle (A).

Manchester.—TC approved two-storey block of 20 flats at 366/374, Wilmslow-rd., Fallowfield, for Granville Holdings, Ltd. Plans by E. E. Costello & Associates, 126, Broad-st., Salford, 6.—Four-storey extension to premises at 23/29, Market-st. and 2/6, Corporation-st. for Montague Burton, Ltd. Plans by Staff A. N. Martin (A), Hudson-rd. Mills, Leeds.—TC approved extensions to St. Clements Church, Toxteth-st. and Ashton Old-rd., Higher Openshaw, for PC Council. A: Leach, Rhodes & Walker, (A/L), 90, Deansgate, Manchester.—Church and social hall at Denmark-rd. and Ripon-st., Greenheys, for Rev. Father M. L. Walsh. A: A. Farebrother & Ptnrs., 99, Seymour-gr., Trafford Bar, Manchester.

Middlesbrough.—British Transport Commission, 222, Marylebone-rd., NW1, are to reconstruct marshalling yard at Newport, Middlesbrough. Work will include demolishing present locomotive shed and transfer of its facilities to new sheds at Thornaby, and diversion of Darlington-Saltburn main line.

Mossley.—BC considering erection of block of four shops with living accommodation over. A: Frank Bradley (F), 4, Wood-st., Bolton.

Newcastle-on-Tyne.—C. Solomon (F), St. Mary's-pl., Newcastle, prepared plans for additional restaurant at Nuns-la. for Bowers Restaurant (Newcastle), Ltd.—Revised plans approved for multi-storeyed garage at Picton-terr. and Vincent-st. for Strakers (Newcastle), Ltd. A: P. L. Browne, Son & Harding (F/F), Pearl-bldgs., Northumberland-st., Newcastle.—Dryden & Shaw (A), 6, Market-st., are A for office and caretaker's flat, Lambton-rd., for Swan Macfarlane & Co.—M. Gatoff (A), 26, Mosley-st., has prepared plans for enlarging offices at Quayside for Common Bros., shipowners.—C. A. Parsons & Co., Ltd., Shields-rd., are to erect offices and laboratory, and have prepared own plans.

Northallerton.—Leathart, Son & Tingay, 49, Welbeck-st., W1, have been appointed A for additions to Northallerton grammar sch., for North Riding EC.

Nottingham.—TC approved erection of premises at 91, Upper Parliament-st. for Richard Payne (Holdings), Ltd. A: Bartlett & Gray (A/A), Castle Gate, Nottingham.

Oldham.—Governors of Hulme grammar sch. propose erection of new science wing, £60,000 est.—BC proposes erection of child welfare centre at Werneth Park.—Methodist Authorities propose erection of new church on Limeside estate.

Preston.—Charles E. Jackson (L), 73, Harrington-ave., Blackpool, is A for proposed St. Bernard's jun. sch. at Lea.

Rochdale.—RC Authorities propose erection of new sec. sch. at Kingsway. A: Greenhalgh & Williams (L/A), 15, Mawdsley-st., Bolton.—Harry Cohen Holdings, Ltd., propose conversion of "The Orchard," Manchester-rd., into luxury flats.

Royton.—UDC proposes extensions at rear of Town Hall.

Scarborough.—Grenfell Baines Group (A/A), Preston, Lancashire, have been appointed A for proposed additions to Scarborough girls' high sch., for North Riding EC.

Scarborough.—E. Allen (A), 32, St. Nicholas-st., Scarborough, is A for proposed showrooms and offices at Victoria-rd. for E. Andrew of Scarborough, Ltd., cycle dealers, etc.

Settle.—RDC proposes erection of 34 houses on site to east of Goodenber-rd., Bentham.

Sheffield.—TC plans erection of 13-storey point blocks of flats in Nethertborpe Greenhill/Bradway and Gleadless Valley areas.—Regional Hospital Board appointed T. H. Thorpe & Ptnrs. (A/A), 41, Friargate, Derby, as A for conversion of Block G into accommodation for mentally defective patients at Ridgeway Hospital, Belper; William Saunders & Ptnrs., Grimsby, as A for adaptations to form psychiatric outpatients clinic at Home No. 5, Scartho-rd., Grimsby, and Adams, Holden & Pearson (FF/AA), 38, Gordon-sq., W1, as A for new radiotherapy centre at Westbourne-hse. site, Sheffield.

Stockton-on-Tees.—British Railways, York, to carry out mechanisation scheme at Stockton railway goods depot.

Stretford.—TC proposes extensions to depot at Longford-rd.; proposes 16 dwellings on War Memorial site, 18 on Old Trafford Conservative Club site, eight at All Saints church and school site, four at Elsinore-rd./Skerton-rd. site, and eight at Chester-rd./Thomas-st. site, and 24 flats on School-rd./Cyprus-st. site.—Approved plans:—Extensions to works at Elevator-rd. for Locomotors, Ltd.; first floor extension at Queen-st. for Capsules, Ltd.; extensions to seven bays at rear of existing workshops at Elsinore-rd. for James Collins & Co., Ltd.

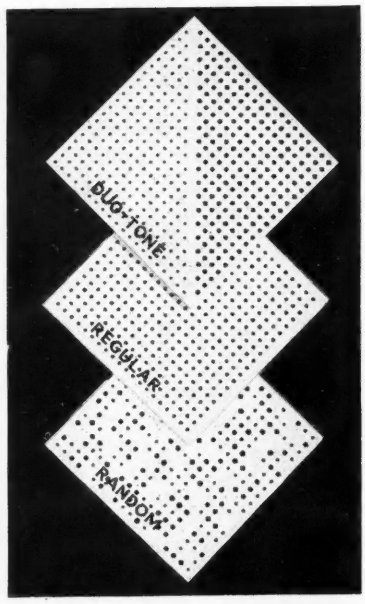
Sunderland.—Matkin & Hawkins (L/F), Barclays Bank-chbrs., Fawcett-st., Sunderland, are A for office extensions at Tavistock-pl. for Sunderland Steamship Protecting and Indemnity Assr.—J. & H. Fowler, builders, Ryhope-rd., Sunderland, propose three pairs of houses, and two detached houses and shops with flats above at Queen Alexandra-rd.—W. & T. R. Milburn (A/A), 18, Fawcett-st., prepared plans for new warehouse at High-st. East, for Bowman Bros.—British Road Services, Ltd., 222, Marylebone-rd., NW1, are to extend their depot at Sikworth-row, and have prepared own plans.

Tynemouth.—Corporation Welfare Com. has approved revised plans for old people's home at The Elms, Preston Park, North Shields. Borough E.: D. M. O'Herlihy, 16, Northumberland-sq., North Shields.

Washington.—E. M. Lawson (A), Barras-bldgs., Barras Bridge, Newcastle-on-Tyne, is A for retail shop and ancillary premises at Oxclose-rd. for Birtley Co-op. Society, Ltd.—Holmes & Jonas, Back Hawthorn-terr., Washington, propose joinery works at Manor Farm-rd., Washington.—The UDC S (T. E. Crowe) to prepare plans for 60 houses under this year's slum clearance plans, and for 200 houses to complete the Coach Road housing estate.—Newcastle Breweries Ltd., Haymarket, Newcastle-on-Tyne, to commence work next year on erection of public house at Coach-rd., Washington.—F. W. Woolworth & Co., Ltd., Armour-hse., Lord-st., Liverpool 2, have submitted revised plans to UDC for shop at Victoria-rd.

Whitley Bay.—Castles, Ltd., builders, 135, Tynemouth-rd., North Shields, to erect 18 houses at Seatonville estate.—J. Gibson Cowe & Son (L), Claremont-chbrs., Newcastle-on-Tyne, have prepared amended layout plans for Seaton Grange estate, and proposals have been prepared for 18 houses. Northumberland EC proposes school at Beresford-rd., Seaton Sluice. County A: C. C. Brown (A), County Hall, Newcastle-on-Tyne.

Wigan.—TC proposes erection of four-storey blocks of flats and maisonettes on Folly and Graysons-yard site.



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TENDERS

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† Denotes *provisionally accepted*.
‡ Denotes *recommended for acceptance*.
§ Denotes *accepted subject to modification*.
¶ Denotes *accepted by H.M. Government Departments*.

Bangor.—84 houses at Maesgeirchen estate for TC. *E. Jones (Contractors), Ltd., Penmaenmawr.

Bermondsey.—Works, for MBC:—12 flats at Block 4, Lockyer estate. ‡Direct labour. £27,627.—Eight maisonettes and one lock-up shop at Block 6, Dunton-rd. site. ‡Direct labour. £21,135.—35 flats at Block A and certain external works at Bush-rd. site. ‡Direct labour. £95,054.

Blaydon, Co. Durham.—Workshops and offices at Chain Bridge-rd., for Marshall Branson, Ltd., to firm's own plans. *Purdie Lumsden & Co., Ltd., Oxford-st., Newcastle-on-Tyne.

Canvey Island.—224 dwellings at Long-rd. for Canvey Island Joint Town Development Com. E&S: J. Jones, AMICE, MIMunE. AMTPI, Civic Centre, Dagenham. *Frank P. Smith, Ltd. £300,272. Road and sewer works, including raft foundations and drains. *Percy Bilton, Ltd. £137,807 (amended tender).

Chelmsford.—Five bungalows, Springfield-rd., for BC. *Hollowell & Rogers, 30 Longstomps-ave., Chelmsford, £6,477.

Coventry.—Proposed Willenhall Wood infants' sch. for EC. *F. Hocking & Sons, Ltd. £44,195 (reduced tender).

Coventry.—Phase II of Central College of Art and Technology for City C. City A: A. G. Ling (F), MTPI. *W. H. Jones & Son, Ltd. £228,316 (reduced tender).

Fulham.—Additional block of 12 flats at Robert Owen House, for MBC. Boro' A and Director of Housing: J. Pritchard Lovell (F).

Rowley Bros., Ltd.	£21,372
Rice & Son, Ltd.	20,917
Patman & Fotheringham, Ltd. ..	20,908
Messrs. E. J. Lacy & Co.	20,703
Y. J. Lovell & Son, Ltd.	19,722
W. J. Marston & Son, Ltd.	18,998
W. H. Gaze & Sons, Ltd.	18,969
Geo. S. Garner & Son (Builders), Ltd.	18,294
‡Tersons, Ltd., 4, Dollis-pk., Finchley N.3	17,911

Greenwich.—13 houses at Roan-st. for MBC.

H.C.S. Building Contractors, Ltd. ..	£29,981
T. Cutler & Sons, Ltd.	£29,051
Herbert Richardson & Co., Ltd. ..	£27,427
Greenaway & Son, Ltd.	£26,370
‡S. Varney & Co., Ltd., Verney-rd., SE16	£25,857

Hartlepool.—Five shops and flats on Trinity Church site, for TC. Boro' E: John Wilkin, Borough-bldgs., Hartlepool. *Atter & Davison, Northgate, Hartlepool (subject to MH&LG approval).

Hebburn.—Heating and hot water installation at new tech. college (second instalment), for Durham CC. *Selborne Engineering Co., Ltd., Selbourne-gdns., Newcastle-on-Tyne. £14,835.

Hereford.—11 'Cornish Unit' bungalows at Hillside, Ross-rd., for City C (for sale). ‡Selleck Nicholls & Co., Ltd.—Six blocks of old people's dwellings at Golden Post/Villa-st. (one block), Portfields (two blocks), and Kingsway (three blocks). ‡H. Vaughan, Hereford. £25,796.

Jarrow, Co. Durham.—New shop at Calf Close-la. estate, for Jarrow and Hebburn Co-op. Socy., Ltd., Albert-rd., Jarrow. Plans by CWS Architects' Dept., 90, Westmorland-rd., Newcastle-on-Tyne. *CWS Building Dept., Benton-rd., Newcastle-on-Tyne.

Lancashire.—Four-span bridge of steel girders in welded construction at Long Riddings on new Lancaster by-pass. Main contractors: Sir Lindsay Parkinson & Co., Ltd. *Robert

Watson & Co. (Constructional Engineers, Ltd.) (sub-contract).

Leeds.—New workshops, stores and offices at Dewsbury-rd., for Longclose Engineering Co., Ltd. *Walter G. Birch (Harrogate), Ltd.—New dairy building at Joppa Works, Kirkstall-rd, for Associated Dairies & Farm Stores, Ltd. *William Airey & Son, Eldon-hse., Woodhouse-la., Leeds.

Liverpool.—Four-storey extension to School of Dental Surgery at Boundary-pl. and Oakes-st. for Senate of University of Liverpool. *William Tomkinson & Sons, Ltd., 7 Gt. Newton-st., Liverpool.

Liverpool.—Works for City C. City A and Director of Housing: Dr. R. Bradbury (F), AMTPI.—108 dwellings at Skirving-st., with site works. ‡Direct labour. £219,305.—Eight houses (two sites), Chirkdale-st. and Ruskin-st. ‡Vallance & Hughes, Ltd., 47, Taylor-st., Liverpool, 5. £16,552.—21 houses (five sites), Beresford-rd, Moses-st. and Isaac-st. ‡C. J. Doyle & Sons, Ltd., Mount Pleasant, Liverpool, 3. £45,514.—18 flats Embledon-st. ‡R. J. Barton & Sons, Ltd., Altcar-rd., Formby. £33,168.—Five houses (two sites), Madryn-st. and High Park-st. ‡G. H. Smith (Liverpool), Ltd., Finvoy-rd., Liverpool, 13. £12,211.

¶London (Admiralty).—Particulars of contracts over £1,000 in value:—*Lancs*: Renovations to houses, A. Thomson, Ltd., 9, Rawlyn-rd., Bolton. *Dunbartonshire*: Demolition, H. M. Murray & Co., Ltd., 255, Bath-st., Glasgow, C2. *Hants*: Demolition, John Hart, Ltd., South Wharf, Cleveland-rd., Gosport, Hants; building work, Warings (Contractors), Ltd., London-rd., Hilsea, Portsmouth. *Lancs*: External painting, Russell Bros., Ltd., Waids House-rd., Nelson, Lancs; construction of pipeline, The Norwest Construction Co., Ltd., Ruthven-rd., Liverpool, 21. *Warwickshire*: Renewal of railway sidings, Grant Lyon & Co., Ltd., 80, Scotter-rd., Scunthorpe, Lincs; internal painting, T. H. Kenyon & Sons, Ltd., Chancellors' Works, Croxley-rd., W9.

¶London (Air Ministry).—New works contracts to value of £500 or over for week ended September 9:—Artificers work: Gaydon, Warwick, Lewis & Watters, Ltd., Lime-ave., Lillington, Leamington Spa, Warwick; Dyce, Aberdeen, Geo. Taylor & Sons, 1, Newton-terr., Bucksburn, Aberdeen. Civil engineering: Cottesmore, Rutland, Gee, Walker & Slater, Ltd., Uttoxeter Old-rd., Derby. Painting work: Cosford, Salop, M. A. Appleton (Contractors), Ltd., 22, Bilston-st., Wolverhampton.

London (British Railways).—Recent contracts placed by North-Eastern Region are:—

West Hartlepool: three 'Atlantis' Coles cranes. Steels Engineering Products, Ltd., Newcastle.—Selby swing bridge: cabling of River Ouse. British Insulated Callender's Cables, Ltd., Belvedere, Kent.—Thornaby motive power depot: erection of fitters' shop and stores, etc. Tarslag, Ltd., Stockton-on-Tees.—Supply of pre-stressed concrete beams. Tarslag, Ltd., Stockton-on-Tees.—Howdon Viaduct, Bridge No. 15: strengthening of deck, etc. E. Davis (Fixers), Ltd., York.

London (British Railways).—Contracts let by London Midland Region.—John Gill Contractors, Ltd., 123, Pall Mall, SW1, for renewal of piling of bridge over Leeds and Liverpool canal between Wigan and Bryn.—Salopian Engineers, Ltd., Prees, Whitchurch, Shropshire, for improved accommodation for stores, Derby locomotive works.—Metal Sections, Ltd., Oldbury, Birmingham, for establishment of flash butt welding depot at central materials depot at Castleton.—Mechanised Contractors (London), Ltd., 25/27, Central-chbrs., Ealing, W5, for deep reballasting and drainage of line between Finmere and Calvert.—Kyle Stewart (Contractors), Ltd., 338, Kilburn High-rd., NW6, for provision of temporary accommodation for G.P.O. staff during improvements at Euston station.—Leonard Fairclough, Ltd., Adlington, Lancs., for work in connection with modernisation of Redlish electric locomotive depot.—Hodgins, Ltd., Building Contractors, Richmond-ave., Fairview, Dublin, for renewal of roof covering Customs transit shed, North Wall, Dublin.—The Butterley Co., Ltd., Butterley, nr. Derby, for reconstruction of bridge No. 30, Friezland and Uppermill Stalybridge and Saddleworth line.

London CC.—Major repairs and improvements at Shacklewell county prim. sch., Stoke Newington and Hackney. Contract would allow for fluctuations in rates of wages and costs of materials (basis A) or in rates of wages only (basis B):—

	Basis	£
W. J. Jerram, Ltd.	A	26,875
J. and R. Rooff, Ltd. ..	A or B	23,993
R. J. Adams, Ltd.	B	23,079
George Barker (Builders), Ltd.	A	21,397
O. H. Groves & Co., Ltd.	A	20,781
	B	20,910
W. Loweth & Sons, Ltd. ..	A	19,421
R. J. Truscott, Ltd.	A	18,713
*S. C. Grover, Ltd., West Ham	A	18,459

London CC.—Major repairs, improvements and redecoration at Wordsworth county prim. and sec. schools, Stoke Newington and Hackney. The contract would allow for fluctuations in rates of wages and costs of materials (basis A) or in rates of wages only (basis B):—

	Basis	£
Fassnidge, Son & Norris, Ltd.	A	23.695
Ward & Paterson, Ltd. ..	B	22,784
Douglas Grant & Partners ..	A	20,686
	B	20,936
O. H. Groves & Co., Ltd. ..	A	19.518
	B	19,750
Yates (Bow), Ltd.	A	18.303
	B	18,650
*Dix (Builders), Ltd., Westminster	A	17,996

Architect's comparable estimate on basis A is £17,917.

London CC.—Major repairs and improvements at De Beauvoir county prim. sch., Hackney. Tenders on basis A allow for fluctuations in rates of wages and cost of materials, and on basis B in rates of wages only:—

	Basis	£
A. T. Chown & Co., Ltd. ..	A	26,626
W. S. Barton & Co., Ltd. ..	A	25,626
Gray, Conoley & Co., Ltd. ..	B	20,950
J. & J. Dean, Ltd.	B	19,829
*Douglas Grant and Partners, Ltd., Finsbury (on basis A)	A	18,870
	B	19,070

Architect's comparable estimate on basis A is £18,591.

London CC.—New practical work block at Hay Currie county sec. sch., Poplar. A: Katz & Vaughan, 17, Gt. Cumberland-pl., W1. Tenders on basis A allow for fluctuations in rates of wages and cost of materials, on basis B, for rates of wages only:—

	Basis A	Basis B
C. P. Roberts & Co., Ltd.	£18,423	£18,673
A. E. Symes, Ltd. ..	18.173	18,550
Howard & Co.	17.824	—
O. H. Groves & Co., Ltd.	17.756	17.930
Prestige & Co., Ltd. ..	17.599	18.040
Hammond & Miles, Ltd.	17,156	17,206
*Yates (Bow) Ltd., Poplar	16.297	16,350

¶London (Metropolitan Police).—Result of tenders:

Ext. and part int. decs., Knockholt police station, Pearce Bros., Builders, Ltd., £289. Int. decs., Commercial-st. police station, G. Butters & Sons. £747. Int. decs., Edward Henry-hse., Campbell Bros., £2,651. Ext. painting and repairs, Devonshire Hall, Frampton Park-rd., G. Butters & Sons, £539. Ext. painting and repairs, Greengate-st., Dundee-rd. and Perth-rd., Plaistow, E13, Moffat Bros., £1,198. Ext. painting and repairs Manor-ct., Barking, Fisher & Stringer, £523.

¶London (MoW).—Contracts placed for week ended September 21:—

Aberdeen: Head Post Office, Peterhead, alterations and improvements, A. Buchan & Son, 1-9, Denmark-st., Fraserburgh, Aberdeen. *Anglesey:* Ministry of Labour, Machine-st., Amlwch, alterations and adaptations, W. Jones & Son, Ltd., 16, Mount-st., Bangor. *Bedfordshire:* Head Post Office, Upper George-st., Luton, alterations, Carter & Simpsons (Builders), Ltd., 89, Stuart-st., Luton. *Cornwall:* Mevagissy, erection of automatic telephone exchange, G. E. Wallis & Sons, Ltd., 25, Boscawen-st., Truro. *Glamorganshire:* St. David's church and hall, Aberdare, conversion to form automatic telephone exchange and welfare accommodation and sundry alterations, G. Warlow & Co., Warlow-st., Merthyr Tydfil. *Hertfordshire:* Ministry of Labour and Hungarian Refugee Hostel, Letchworth, external decorations, W. T. Pickering & Sons, Ltd., 19, Watford Heath, Watford; Two Waters Industrial Area, Hemel Hempstead, erection of Post Office engineering depot, Sir Lindsay Parkinson & Co., Ltd., 6, Lambeth-rd., SE1. *Inverness:* Government office building, Longman-rd., Inverness, alterations and extensions, D. Forsyth & Co., Ltd., 7, Reidhaven-st., Elgin. *Lancashire:* Ministry of Works store, Guide Bridge Mill, Ashton-under-Lyne, internal painting, G. Whitehead, New Radcliffe-st., Henshaw-st., Oldham. *London:* King Edward-bldg., King Edward-st., EC1, building work in connection with replacement of Post Office railway lift 14, H. C. Horswill, Ltd., 182, Green-st., Forest Gate, E7; Ministry of Supply, temporary office building, Leysdown-rd., Mottingham, SE9, internal decorations, South London Decorators, Ltd., 9, Streatham High-rd., SW16; Kelvin-hse., Cleveland-st., W1, internal decorations, South London Decorators, Ltd., 9, Streatham High-rd., SW16. *Monmouthshire:* Post Office, Usk, new sorting office and welfare block and alterations to main building, W. J. Sweet & Sons, Ltd., Ty Brith, Usk. *Norfolk:* Government factory site, Mile Cross-la., Norwich, conversion of existing building into veterinary investigation centre, J. Younger & Son, Ltd., City-rd. Works, Norwich. *Surrey:* Ministry of Agriculture, Fisheries and Food, New Haw, Weybridge, erection of new isotope laboratory and canteen, E. Clarke & Sons (Addlestone), Ltd., Addlestone, Surrey; Kew Gardens, internal decorations at temperate house, South London Decorators, Ltd., 9, Streatham High-rd., SW16. *Yorkshire:* Head Post Office, Lowgate, Hull, internal decorations, F. A. Wells, Ltd., 1, Marlborough-ave., Hull.

¶London (War Dept.).—Works contracts placed for week ended September 20:—*Co. Antrim*: Roadwork, T. G. Troughton, Portadown. *Berkshire*: Building, Universal Housing Co., Ltd., Rickmansworth. *Cornwall*: Miscellaneous, Harris & Son (Builders), Ltd., Barnstaple. *Devon*: Miscellaneous, H. E. Hansford, Honiton. *Hampshire*: Painting, Decorative Painting Contractors, Ltd., Hounslow; roadwork, O. J. Elliott & Co., Ltd., Bristol; building, Lee Bros. (Aldershot), Ltd., Aldershot. *Middlesex*: Miscellaneous, H. Goodsell & Son, Ltd., Maidstone. *Shropshire*: Heating, Industrial & General Engineering Co., London. *Staffordshire*: Roadwork, Tarslag, Ltd., Wolverhampton. *Wigtownshire*: Hutting work, J. Brown & Son (BC), Ltd., Stranraer; demolition, James Miller & Ptnrs., Ltd., Edinburgh.

Macclesfield.—12 houses at Hough Green. Rainow, for RDC. *R. Maddick, Bollington. £13,563.

Maidenhead.—Block of 20 old people's flats at Spencers estate for BC. BS. *Clayton Heath, Ltd., Boyn Works, Maidenhead, £21,308.

Maidenhead.—Block of offices at Cedars-rd. for Circular Distributors, Ltd. A: Eric G. V. Hives (L), 46 Queen's-rd., Reading. *J. M. Jones & Sons, Ltd., Maidenhead, £44,000 (negotiated contract).

Mansfield.—Nine shops and eight flats at Ladybrook estate for BC. *Direct labour. £37,426.

Minsterley, Salop.—Further extensions to premises for Minsterley Creameries, Ltd. *Higley & Son, 9 Pride Hill-chmbrs., Shrewsbury.

Newcastle-on-Tyne.—Structural steelwork for proposed Kenton sec. mod. boys' and girls' sch., for EC. A: Spence & Price, 26, St.

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Mary's-pl., Newcastle. *Austin, James & Son, Ltd., Dewsbury. £21,894.

Norfolk.—First section of Old People's Home at rear of Howdale Home, Downham Market, for CC. County A: C. H. Thurston (L), FRICS. *Walter Lawrence & Son, Swaffham, Norfolk, £21,095.

North East Metropolitan Regional Hospital Bd.—Works for Bd. Regional A: W. G. Plant (F), 11a, Portland-pl., W1. Nurses' recreation hut at Prince of Wales's General Hospital. *Henry Knight & Sons, Ltd. £12,197; new boiler house at St. Andrew's Hospital, Bow. *Masons (Plaistow), Ltd. £19,060; extensions at Brentwood Blood Transfusion Centre. *James Eaton & Sons. £14,454; improving sanitary arrangements in East surgical wards at North Middlesex Hospital. *J. & R. Rooff, Ltd. £15,250; new operating theatre suite at Harold Wood Hospital. *A. E. Symes, Ltd. £58.000; alterations and extensions to X-ray dept. at St. Margaret's Hospital, Epping. *S. Cronin & Sons, Ltd. £11.813; converting Ward C.1 to pathological laboratory at Herts. and Essex General Hospital. *J. L. Glasscock's Successors, Ltd. £15,378; adaptations to provide new physiotherapy dept. at St. Andrew's Hospital, Bow. *William J. Jerram, Ltd. £18,247.

Northumberland.—Four-classroom unit at Gosforth sec. sch., for EC. *Cawood, Wharton & Co., Ltd., Harrogate. £10.000.

Reading.—Reconstruction of Abbey Hall, King's-rd., as office building for Mid-Century Securities, Ltd. A: Eric G. V. Hives (L), 46 Queen's-rd., Reading. QS: Henry Cooper & Sons, F/FRICS, 64 London-rd., Reading. *J. M. Jones & Sons, Ltd., Maidenhead.

Salford.—142 dwellings at Southgarth for City C. A: Wilfrid Thorpe & H. Hirst Smith (L/F), 65, Barton-arcade, Manchester, 3. *G. & J. Seddon, Ltd., Little Hulton. £191,224 (subject to approval of MH&LG).

Sheffield.—Dining-hall, kitchens, etc., at Kenwood Hotel, Kenwood-rd., for Sheffield Institute for the Blind. *Tom Holmes & Sons, Ltd., Bradway, Sheffield. £25.000.

Slough.—(1) 309 houses at Farnham Royal estate for BC. Boro' E: E. Gardner Thorp, MICE. QS: Young & Brown. *C. Bryant & Son, Small Heath, Birmingham, 10. £464,310.

Stockport.—64 dwellings and seven garages at Hillcrest-rd. site, Offerton, for TC. *Owen Pickford & Ptnrs., Ltd., Stockport, £103,345.

Stokesley.—Works, for RDC. S: H. Johnson, Council Offices, Stokesley. 20 houses and 4 bungalows, *J. H. Fawcett, Normanby, Middlesbrough. 20 houses, *Tarslag, Ltd., Bowesfield-la., Stockton-on-Tees.

Sutton Coldfield.—240 dwellings, roads and sewers at School Farm estate for Carlton Construction & Development Co., Ltd. *Carlton Contractors, Ltd., Ashley-rd., Epsom, Surrey.

Tamworth.—286 houses and flats and 83 garages in Comberford-rd. area, for TC (part of Birmingham Overspill project), "subject to satisfactory arrangements with regard to grants, subsidies and interest rates." Gregory Housing, Ltd., £450,000.

Tynemouth.—Heating installation at Tynemouth tech. sch., for EC. A: G. H. Gray & Ptnr. (F/A), Camden-st., North Shields. General contrs.: J. H. Rogers, Regent-terr., North Shields. *G. N. Haden & Sons, Ltd., 79, Quayside, Newcastle-on-Tyne. £13,980.

Warrington.—33 houses at Chapel-la., Burtonwood, for RDC. *E. Lunt & Son, Ltd., 6 Lord Nelson-st., Warrington. £54.945.—seven houses at Padgate Training College for Lancs CC. *G. & J. Seddon, Ltd., Little Hulton, nr. Bolton (negotiated contract).—New store, assembly and paint shops for Richmond Gas Stove Co., Ltd. *J. R. Ashall, Ltd., Greenway, Paddington, Warrington.

Wellington, Salop.—New office and canteen blocks at Shifnal-rd., Ketley, nr. Wellington, for Midlands Electricity Board. *Spicers (Builders), Ltd., Ombersley-rd., Worcester.

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